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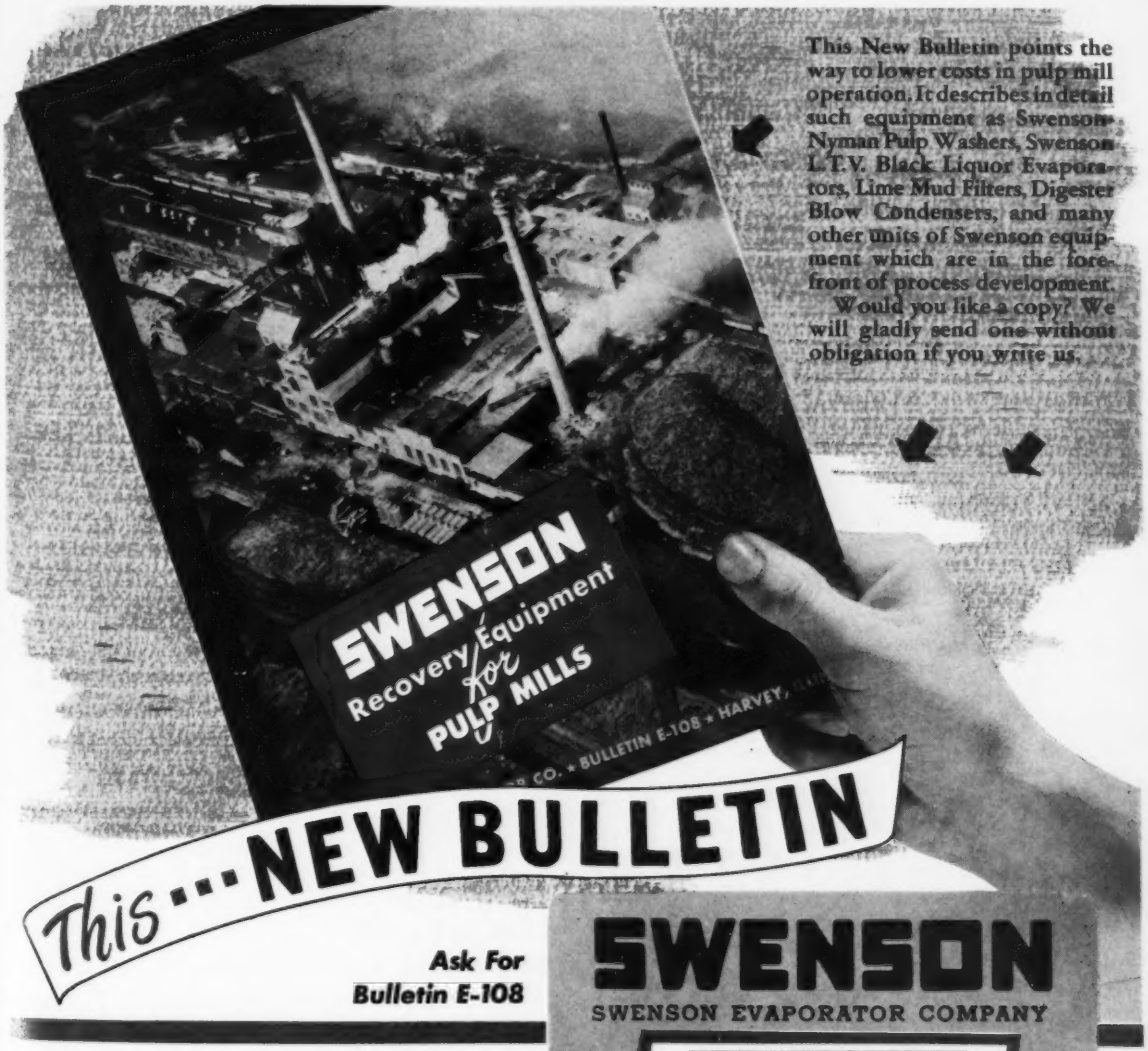
VOLUME 127, No. 22 NOVEMBER 25, 1948




This New Bulletin points the way to lower costs in pulp mill operation. It describes in detail such equipment as Swenson-Nyman Pulp Washers, Swenson L.T.V. Black Liquor Evaporators, Lime Mud Filters, Digester Blow Condensers, and many other units of Swenson equipment which are in the forefront of process development.

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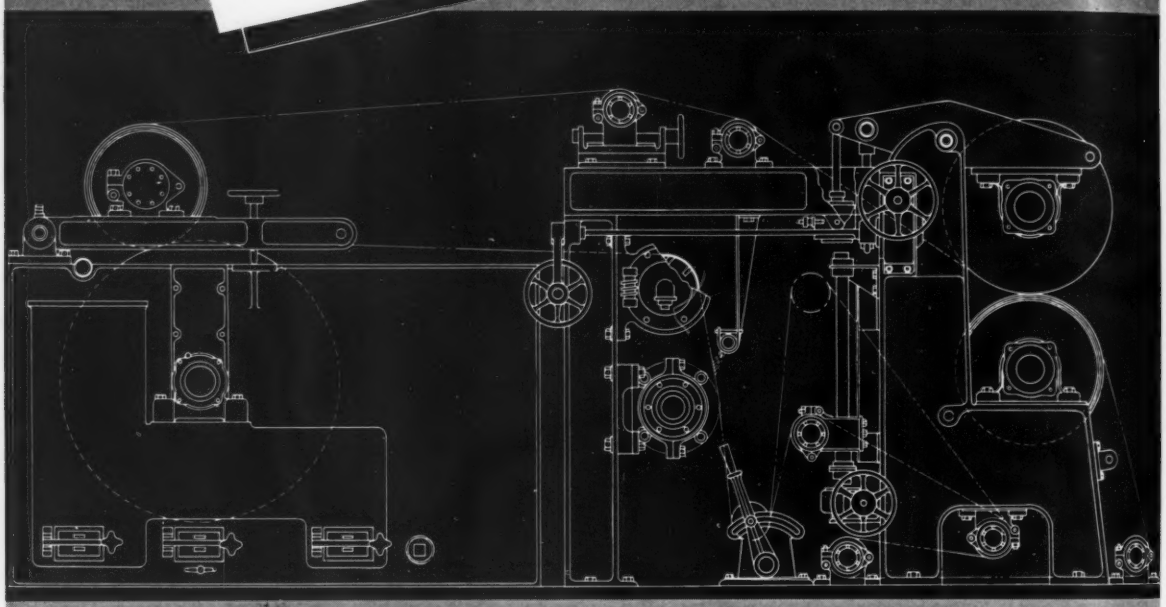

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MEMBER

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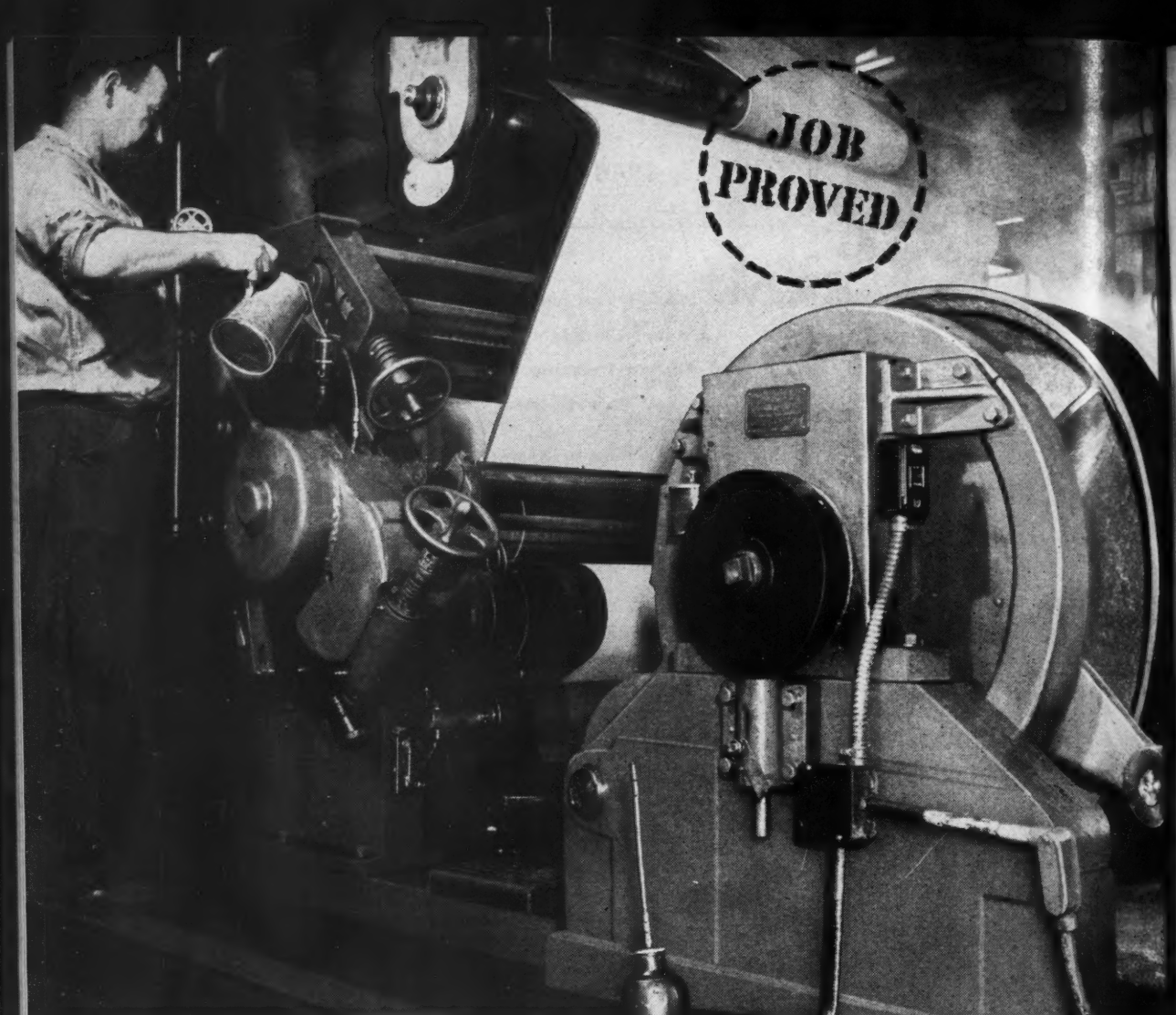


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Paper TRADE JOURNAL
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NOV. 25, 1948

VOL. 127, NO. 22

# Says U. S. Wood Pulp Supply-Demand Balances

BELLINGHAM, Wash.—National supply of wood pulp has finally been brought into balance with demand, according to F. G. Stevenot, president of the Puget Sound Pulp & Timber Co. New supply of pulp provided by domestic production and imports reached the all-time record figure of 11,276,000 tons in the first nine months of 1948, the total comparing with 10,519,000 tons in the corresponding months of 1947. Pulp receipts in the first nine months of this year not only took care of current demand, but permitted an increase in mill inventories from 642,000 tons at the end of August 1947 to 765,000 tons on this year's corresponding date.

Midyear marked the turning point, Stevenot noted. In his periodic review of the national pulp situation he observes that whereas new supply provided in the first six months of 1948 was 9.5 percent greater than in that period last year, the third quarter increase was only 2.9 percent above 1947 tonnage. For the first nine months as a whole, domestic production of pulp totaled 9,631,000 tons this year in comparison with 8,874,000 tons last year. Imports, on the other hand, registered a decline, 1,714,000 tons this year comparing with 1,729,000 tons last year. Domestic production, after scoring 7.7 percent gain over last year in the first six months, went forward in the third quarter to register 10.2 percent increase over the comparable 1947 period. On the other hand, third quarter imports were 28.5 percent less than a year ago, a sharp reversal from the trend in the first half of the year, in which this year's receipts ran 18.7 percent ahead of last year's.

"Allocations have become a thing of the past," Mr. Stevenot stated. "Backlogs have been cleared, and a narrowing of the profit margin is to be expected. Consensus of the industry is that business volume around the present highly satisfactory level will prevail for several months ahead."

# Pulp and Paper, Canada's Leading Industry, Growing

OTTAWA—Canada's pulp and paper industry in 1947 smashed various records achieved the previous year, to retain its position as the country's leading industry, the Dominion Bureau of Statistics reports.

Gross value of the industry's products reached $706,972,000 during the year, an advance of almost 34 percent over 1946, while the net value of products—the value added by manufacture—was 38 percent higher at $356,085,000

It also is reported that during October 1948 the industry operated at an all-time high to produce 399,788 tons, an increase of 3,537 tons, or 0.9 percent, over last October's peak of 396,251 tons, and comparing with September's 376,062 tons and the previous high for the current year of 391,481 tons established in July.

This amount represents an all-time high for any month, although October was an average month of 26 working days. Production in October represented 106.1 percent of rated capacity, compared with 103.8 percent the previous month and 104.7 percent in October, 1947.

Production for the first ten months of the year was also a new record at 3,817,437 tons, an increase of 104,056 tons, or 2.8 percent, over the similar period of 1947. Canadian shipments in October amounted to 392,560 tons and were 3,055 tons, or 0.8 percent, higher than in October, 1947. Shipments represented 104.2 percent of rated capacity, compared with 107.1 percent in September and 102.5 percent in October 1947.

As October production exceeded shipments by 7,228 tons, there was a corresponding increase in stocks held by Canadian manufacturers.

In all, 115 mills operated in 1947, an increase of two over 1946. The 88 mills manufacturing pulp produced 7,253,671 tons valued at $403,853,235, compared with 6,615,410 tons valued at $287,624,227 in 1946, representing increases in quantity and value of 9.7 percent and 40.4 percent, respectively.

Of this 1947 total, 72.4 percent, or 5,250,204 tons valued at $204,091,361, was produced by combined pulp and paper mills for their own use in papermaking, equal to increases of 6.7 percent in tonnage and 30.1 percent in value over the 1946 figures.

Over 23 percent of the total pulp production was made for export, with tonnage 17.7 per cent and value 52.1 per cent higher than in 1946. The remainder, about four percent of the total production, was made for sale in Canada and showed increases both in quantity and value of about 21.4 percent and 57.8 percent respectively.

The 86 mills making paper in 1947 produced 5,775,082 tons of paper and paperboard valued at $507,101,277 as compared with 5,347,118 tons valued at $396,956,390 in 1946, representing increases of eight percent in tonnage and 27.7 percent in value. Newsprint made up 77.5 percent of the total reported tonnage of paper manufactured in 1947, with an output of 4,474,264 tons valued at $355,540,669 compared with 4,162,158 tons valued at $280,809,610 in 1946.

The apparent total production of pulpwood in 1947 was 11,484,522 rough cords valued at $237,488,741, compared with 10,523,256 rough cords valued at $183,085,359 in 1946. This represents increases of 9.1 percent in volume and 29.7 percent in value. Of the total 1947 production, about 83 percent was manufactured into pulp in Canadian pulp mills.

Exports of paper and paper goods during 1947 were valued at $373,133,338, compared with $287,437,804 in 1946. These exports were made up chiefly of newsprint paper—4,220,779 tons valued at $342,293,158 being exported, compared with 3,858,467 tons valued at $265,864,969 in 1946.

Exports of paperboard were next in importance and were valued at $6,940,775. Value of paper and paper goods imported in 1947 was $23,027,200, an increase of 22.3 percent over 1946.

# GPO Semi-Annual Printing and Binding Bids

WASHINGTON — The Government Printing Office opened bids on November 15 from suppliers of materials for the public printing and binding for the six months' period beginning January 1, 1949. Bids were as follows:

| | |
|---|---|
| No. 210 | |
| Kardon Box Co. | $95.00 |
| No. 211 | |
| Kardon Box Co. | $7.75 |
| Rogers Printing Co. | $7.81 |
| Climax Mfg. Co. | $8.89 |
| Container Corp. of America | $7.84 |
| No. 212 | |
| Climax Mfg. Co. | $8.80 |
| Rogers Printing Co. | $8.80 |
| Climax Mfg. Co. | $9.60 |
| Container Corp. of America | $8.80 |
| No. 213 | |
| Vernco Specialties Co. | $112.75 |
| Kieckhefer Container Corp. | $129.70 |
| The Container Corp. of America | $117.35 |
| J & J Corrugated Box Corp. | $115.50 |
| Standard Corrugated Case Corp. | $114.75 |
| Allcraft Corrugated Corp. | $125.15 |
| No. 214 | |
| Vernco Specialties Co. | $ 98.00 |
| Kieckhefer Container Corp. | $104.00 |
| Container Corp. of America | $102.40 |
| J & J Corrugated Box Corp. | $ 99.45 |
| Standard Corrugated Case Corp. | $ 99.05 |
| Allcraft Corrugated Corp. | $102.30 |
| No. 215 | |
| Vernco Specialties Co. | $75.65 |
| Kieckhefer Container Corp. | $84.85 |
| Container Corp. of America | $79.10 |
| J & J Corrugated Box Corp. | $76.60 |
| Standard Corrugated Case Corp. | $78.10 |
| Allcraft Corrugated Corp. | $80.00 |
| No. 216 | |
| Vernco Specialties Co. | $66.75 |
| Kieckhefer Container Corp. | $77.05 |
| Container Corp. of America | $71.90 |
| J & J Corrugated Box Corp. | $68.90 |
| Standard Corrugated Case Corp. | $77.70 |
| Allcraft Corrugated Corp. | $72.00 |
| No. 217 | |
| Vernco Specialties Co. | $45.65 |
| Kieckhefer Container Corp. | $43.70 |
| Container Corp. of America | $41.10 |
| J & J Corrugated Box Corp. | $40.55 |
| Standard Corrugated Case Corp. | $41.65 |
| Allcraft Corrugated Corp. | $39.00 |
| No. 218 | |
| Vernco Specialties Co. | $49.85 |
| Kieckhefer Container Corp. | $48.70 |
| Container Corp. of America | $44.45 |
| J & J Corrugated Box Corp. | $43.95 |
| Standard Corrugated Case Corp. | $46.15 |
| Allcraft Corrugated Corp. | $43.75 |
| No. 219 | |
| Vernco Specialties Co. | $105.90 |
| Kieckhefer Container Corp. | $117.45 |
| Container Corp. of America | $110.30 |
| J & J Corrugated Box Corp. | $108.00 |
| Standard Corrugated Case Corp. | $107.95 |
| Allcraft Corrugated Corp. | $115.00 |
| No. 220 | |
| Vernco Specialties Co. | $322.50 |
| Allcraft Corrugated Corp. | $445.85 |
| No. 221 | |
| Fiens' Tin Can Co., Inc. | $121.00 |
| No. 222 | |
| Fiens' Tin Can Co., Inc. | $153.00 |
| No. 223 | |
| Fiens' Tin Can Co., Inc. | $184.75 |
| No. 227 | |
| Vernco Specialties Co. | $89.45 |
| Kieckhefer Container Corp. | $89.05 |
| Container Corp. of America | $90.25 |
| J & J Corrugated Box Corp. | $87.55 |
| Standard Corrugated Case Corp. | $91.65 |
| No. 228 | |
| Vernco Specialties Co. | $94.85 |
| Kieckhefer Container Corp. | $93.25 |
| Container Corp. of America | $93.70 |
| J & J Corrugated Box Corp. | $96.35 |
| Standard Corrguated Case Corp. | $94.35 |

## Basing Point Puzzle

WASHINGTON—In endeavoring to enforce its recently stated concept of what is and is not competition—i.e. absorption of freight rates—the Federal Trade Commission is charging a long list of companies with violations of the anti-trust laws and with conspiracy.

An example of its reasoning may be gathered from the experiences of A. E. Staley & Co., a little business concern processing corn and soybeans that became a fairly large company by meeting competition.

* * *

Staley along with other companies in the same field are accused of conspiracy. This is how the FTC interprets "conspiracy."

"One company may invade another company's territory and absorb freight charges to meet the other's price. Or, it may be the other way around. But if both invade each other's territory and over a period of time each absorb the freight, then the commission rules a "conspiracy exists."

There need be no evidence of an agreement or a combination of the competing companies. In the commission's eyes a reciprocal invasion of markets is prima facie "evidence of a conspiracy."

* * *

The Staley company through its executive vice-president, E. K. Scheiter, puts it this way:

"The Staley company, unable to sell our output in a so-called 'natural' market, takes a poke at a competitor by absorbing freight to pick up one or more of his customers. The competitor doesn't like it. He retaliates and, ipso facto, a conspiracy is created, says the commission. This is truly a strange definition of a conspiracy. A competitive action followed by a competitive reaction produces a conspiracy.

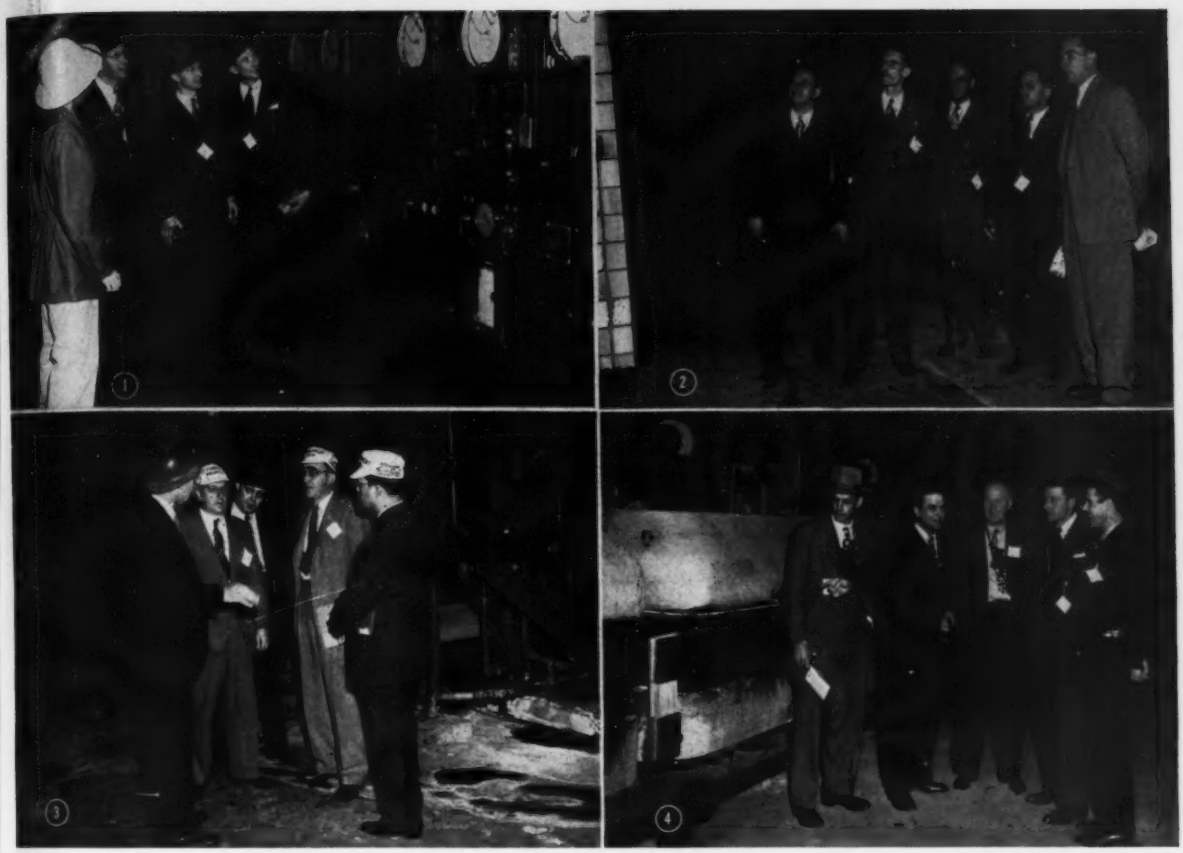
"On the other hand, if, fearful of the wrath of the commission, we remain in our own natural market and our competitor remains in his, so that each of us has a perfect monopoly, then the respective monopolies, undisturbed by reciprocal invasion, become competition. This definition of competition is as strange as the commission's definition of conspiracy."

## Krancher Initial Speaker

MIDDLETOWN, Ohio—The first talk in the second series of the Black-Clawson-Shartle-Dilts Lecture Course program on "Modern Methods of Manufacture of Pulp and Paper" was presented November 3, in the Shartle classroom at the Shartle office here. C. C. Krancher, plant manager of Ball Bros. Co., Noblesville, Ind., presented a comprehensive talk on "The Manufacture of Straw Papers for Corrugating." He showed samples of the raw product, cooked and beaten straw, and a .009-point sheet of straw paper ready for corrugating. Also shown were samples of the finished corrugated container board, both single-face and double-face sheet. The talk was followed by a question and answer session which aroused a lively discussion.

## CROSSETT LUMBER CO. RESEARCH LABORATORY READY

**NEWLY COMPLETED research laboratory of the Crossett Lumber Co., Crossett, Ark., which will be under the direction of Kenneth G. Chesley. . . . The staff will conduct research in the pulping aspect of papermaking, as well as papermaking itself. Miniature equipment in a special department of the building will enable researchers to carry out on a small scale the same processes that are conducted industrially in the mill. This small-scale operation permits close observation, enabling the scientist to study the specific aspect of the work in which he is particularly interested. . . . Essentially a T-shaped structure, each wing of the laboratory performs a separate and distinct function; one houses the office and library, another the laboratory and the third, the pilot plant. The interior wood stud walls may be re-arranged at will, permitting wide latitude in allocating space to various departments currently as needed. . . . The Crossett Chemical Co., a wood distillation industry, will be served by the new laboratory as will the Crossett Lumber Co.**



## TAPPI MEN SEE CHLORINE AND CAUSTIC SODA OPERATION AT NATRIUM, W. VA.

TAPPI members who attended the recent General Testing Conference in Pittsburgh, inspected the chlorine and caustic soda production operation of the Natrium, W. Va., plant operated by the Columbia Chemical Division of the Pittsburgh Plate Glass Co. 110 miles below Pittsburgh on the Ohio River. . . . C. Earl Wolf, plant superintendent, and Nelson Elhers, assistant superintendent, traced the war-time history of the plant and answered queries on alkali production and handling problems. . . . Pre-Pearl Harbor studies by Columbia were responsible for locating the Natrium plant in an area in which alkalies had not previously been produced, they pointed out. . . . Columbia found that the salt stratum underlying its Barberton, Ohio, plant extends into West Virginia. At the Ohio River, water is available; the area is in the midst of great coal fields and is centrally located in relation to markets. The one factor which presented unusual engineering problems is the great depth of the salt deposit. . . . Salt brine at the plant is pumped from wells more than 6,800 feet deep, the world's deepest in commercial use. . . . The advantages of river transportation are utilized through pioneering development of special chlorine and caustic soda barges. . . . In the pictures above are: (1) Left to right: Joseph Fraker, Columbia Chemical Division engineer; Richard T. Bingham, of TAPPI; A. R. Ewing, Bemis Bros. Bag Co.; and E. W. Beaudais, American Pulp & Paper Co. . . . (2) Left to right: L. C. Gischig of the Philip Carey Mfg. Co.; J. R. Gunning, Provincial Paper, Ltd., Canada; L. B. Taylor, technical service, Columbia Chemical Division; M. E. Fritz, Detroit Sulphite Pulp & Paper Co.; Mr. Elhers. . . . (3) Left to right: John Michaelis, Natrium chief engineer; K. S. Whisler of the P. H. Glatfelter Co.; Dr. A. E. Boss, Columbia's manager of pigment sales; J. K. Dyer and A. E. Reed of the Gaylord Container Corp. . . . (4) Left to right: R. K. Guinard of the New York & Pennsylvania Paper Co.; Quentin Ebert, chlorine foreman; R. G. Macdonald, TAPPI secretary; P. A. Fadar, of Columbia's market research and development department; and H. H. Bell, New York & Pennsylvania Paper Co.

## Printing Ink Research

BETHLEHEM, Pa.—The National Printing Ink Research Institute at Lehigh University here was host on November 13 to editorial representatives of 15 business papers in the graphic arts and allied fields, including E. P. Nuttall of *Paper Trade Journal*.

How the Institute is set up, what equipment and personnel it has and the progress it has made in the two and one-half years since its establishment were explained and shown to the visitors.

In charge of the visit were Dr. Albert C. Zettlemoyer, research director and associate professor of chemistry at Lehigh, and Dr. William C. Walker, associate director. Dr. H. A. Neville, director of the Lehigh Institute of Research, spoke on the value of industrial research at a discussion meeting preceding a tour of the Institute.

The National Printing Ink Research Institute, supported by about 30 member printing ink making firms, was established in 1946. It is governed by a board of directors, of which Anthony J. Math, president of the Sinclair & Valentine Co., New York, is chairman, and a technical advisory committee.

Standard test methods are being developed to form the basis for a techcal language to make possible clear interchange of technical information and thus to catalyze scientific advances in the printing ink industry. Certain problems common to the entire industry are under study, such as loss of drying on aging, greasing of lithographic inks and prospective new raw materials. Fundamental research studies are also being made of the physicschemical systems encountered in printing ink.

## Heyden-Rumford Purchase

NEW YORK — Purchase by the Heyden Chemical Corp., New York, of the assets of Rumford Chemical Works, near Providence, R. I., has been completed. The assets of Rumford were acquired by Heyden in exchange for 99,438 shares of Heyden common stock and the assumption of outstanding liabilities. The stock will be distributed pro rata among Rumford holders.

# Survey of 59 Percent of Nation's Forests Completed

WASHINGTON — Surveys of the timber resources on 63,000,000 acres of forest land in 12 states and the re-inventory of an additional 48,000,000 forest acres in eight other states have been completed within the past two years, the Forest Service in the U. S. Department of Agriculture reported on November 18. Preparation of the survey data for publication by states and counties is now in progress and will be made available to states, industries, and interested communities as soon as possible.

The 63,000,000 acres of forest land surveyed for the first time during the last two years brings to 365,000,000 acres the total so inventoried since the project to survey the nation's timber resources was begun in 1930, leaving 259,000,000 acres still to be covered. Provision for periodic re-inventory of the timber resource on land already surveyed, with a view to keeping the reports up to date, was made by Congress in 1944 and up to now 48,000,000 acres have been gone over for the second time. Cutting operations, forest fires, attacks of insects and disease and changes due to growth are principal factors in making it necessary to recheck these areas if the survey figures are to be kept current.

The surveys were made for areas where reliable information as to forest areas, timber volumes, rates of growth and depletion, ownership, and demand for forest products are vitally needed as a guide to sound programs for industrial development, taxation, fire prevention, and land management.

Initial surveys were conducted during the past two years in these 12 states: Arkansas, California, Illinois, Kentucky, Missouri, Montana, New Hampshire, Maine, New York, Pennsylvania, Vermont, and West Virginia. The eight states where re-survey jobs were done are: Idaho, Michigan, Minnesota, Mississippi, Oregon, South Carolina, Washington, and Wisconsin. Reports on these surveys are being published as rapidly as possible.

To facilitate the surveys several of the states have contributed a total of $306,000 in money, equipment, or other aids, an amount equal to about 20 percent of the available federal funds. These states are: Illinois, Maine, Michigan, Minnesota, New Hampshire, New York, Oregon, Pennsylvania, South Carolina, Vermont, West Virginia, and Wisconsin.

The Forest Service has inventoried initially approximately 59 percent of the country's 624,000,000 forest acres, survey of which was contemplated when the McSweeney-McNary Act was passed in 1928. The total job of collecting, analyzing, and publishing the information is about three-fourths completed. So far about 62 percent of the $6,500,000 authorized by the act as amended in 1944 has been used. Rising costs and the decreased value of the dollar partly account for the spread between accomplishment and expenditures, but the Forest Service believes part of the rise in cost can be offset by means of improved survey techniques.

It has been found that through the use of aerial photography it is possible to ascertain the extent of forested areas, to classify the forest as to timber size and whether softwoods or hardwoods, and even to estimate tree height and crown diameters. This reduces some of the ground work formerly thought necessary in timber surveys. Still to be surveyed for the first time are the vast forested areas in the Rocky Mountain States, and it is hoped that by the time these are reached, techniques for making the surveys by means of aerial photography will have been further perfected. It is not felt, however, that aerial photos will ever completely eliminate the need for ground work to determine the quality of the timber, measure "understory" trees not discernible on these photos and to identify timber species with complete accuracy.

In addition to being of value to interested state and county governments the reports, statistical data, and maps furnished by the Forest Survey are used by Congressional Committees and by numerous government agencies. They are also used by pulp, paper, and lumber companies, railroads, universities, research and planning groups, utility companies, manufacturers, miners, and many other business and professional agencies and individuals.

## Canadian Paper Output

OTTAWA—The Canadian Government reports that production of all kinds of paper during 1947 showed increases in both volume and in value, with the percentages of increase over the preceding year for each kind of paper showing the following:

| | Volume % | Value % |
|---|---|---|
| Newsprint paper | 7.5 | 26.6 |
| Groundwood printing and specialty paper | 10.6 | 35.0 |
| Book paper | 15.1 | 35.9 |
| Fine papers | 7.8 | 28.5 |
| Miscellaneous fine papers | 11.8 | 36.3 |
| Tissue paper other than sanitary | 17.2 | 18.6 |
| Sanitary papers | 19.8 | 48.6 |
| Special industrial papers | 8.4 | 25.9 |
| Wrapping papers | 7.6 | 25.1 |
| Building papers | 12.4 | 21.8 |
| Paper boards | 6.4 | 30.2 |
| Building boards | 31.5 | 41.3 |

With 53.7 percent of the total paper production, the Province of Quebec leads in the manufacture of newsprint, wrapping paper, tissue paper and miscellaneous papers. Ontario is second with 30 percent, leading in the production of book and writing paper and paper boards. British Columbia with 7.1 percent is in third place, followed by New Brunswick, Nova Scotia and Manitoba which together account for the remaining 92 percent.

## Canadian Pulp Output

OTTAWA — The Canadian Government reports that groundwood pulp formed 58.9 percent of the total quantity of pulp made in Canada in 1947. Unbleached sulphite accounted for 18.2 percent, more than four-fifths consisting of news grade and the remainder of "strong" pulp. Bleached sulphite made up 9.7 percent of which about four-sevenths was paper pulp and three-sevenths dissolving pulp, the latter used in the production of rayon, celanese, cellophane and pulp-based plastics. Sulphate pulp represented 9.5 percent of the total, mechanical screenings one percent, chemical screenings 1.1 percent, defibrated and exploded fibre 0.8 percent, and all other pulp 0.8 percent.

This official report shows the Province of Quebec as leading in the manufacture of pulp with 51.7 percent of the 1947 total and Ontario second with 29 percent. New Brunswick, British Columbia, Nova Scotia and Manitoba follow in that order, British Columbia accounting for 8.2 percent and the three other provinces for 11.1 percent.

## QM Bids and Awards

NEW YORK—Invitations to Bid have been issued by the New York Quartermaster Purchasing Office, 111 East Sixteenth street, New York City, on the following items:

QM-30-280-49-500 — Fillers, double-faced corrugated fiberboard (various sizes)—strawboard, 65,800 each; Paper, kraft, 24 inches by 96 inches, Gr.B, No. 2, 60-pound weight, 9,700 each; Sheets, fibre solid, weatherproof, Type SF, 3,000 each.

Bids will be opened November 30, 1948, at 3:00 est, at the New York office. Delivery: January, 1949, completion date.

Award has been issued on QM-30-280-49-298 covering paper, containers, ice cream. lock top (type), 2½ gallons capacity, to Sealright Pacific, Ltd., Los Angeles, Calif. Quantities, 575,000 each @ $.10519, and 345,000 each @ $.10835.

## Canada's Imports Drop

OTTAWA — Imports of paper into Canada declined to $1,291,000 during September, compared with $1,790,000 in the same month a year ago and dropped to a total of $12,879,000 in the first nine months of 1948 ending September as against $17,234,000 during the corresponding period last year, the External Trade Branch of the Canadian Government reports.

## Dam Peril Seen

SPRINGFIELD, Mass. — Paper manufacturers in the Connecticut Valley, mindful of the damage caused here by the 1936 flood, have expressed alarm over a warning issued November 14 by Col. James H. Stratton, acting division engineer of the Army Engineering Corps, who informed Mayor Daniel B. Brunton that lack of maintenance on the flood control dikes in Springfield might result in their failure under strain.

Following a recent inspection of the flood walls, Col. Stratton made reference specifically to three sections of the flood control system, directing attention to previous reports citing the poor condition of the section of the dike running from Clinton street to the North End Bridge—a flood wall protecting much of the industrial area.

However, Superintendent Charles A. Bailey, Jr., of the Department of Streets and Engineering, to whom Mayor Brunton forwarded a copy of the report, declared that the dikes are entirely safe as far as flood protection is concerned, adding he had made a personal inspection Nov. 10th of the entire system.

The specific repairs mentioned in the Army engineer report represent an accurate picture of conditions, Mr. Bailey said. However, he pointed out that his department recognized the need for improved maintenance and has spent more than $20,000 on the system during the last seven or eight months.

## Canadian Fuel Dollar

OTTAWA—The cost of purchased fuel used in 1947 was $31,833,560, representing an increase of 39.4 percent from the corresponding figure for 1946, the Canadian Government discloses for the pulp and paper industry in the past year, pointing out that Canadian-mined coal represented 77 percent of the fuel cost in the Maritime Provinces, 16.4 percent only in Quebec, and imported coal made up 78.8 percent of the latter's cost.

The principal fuel in Ontario was imported coal which amounted to 87.2 percent of the fuel bill in the industry in that province. In Manitoba, Canadian-mined coal represented 71.4 percent of the fuel cost. In marked contrast to the other provinces, 74.7 percent of the fuel cost in British Columbia went to fuel oil. Some mills also reported the use of 64,097 cords of slabs and edgings, 18,992 (of 200 cu.ft. each) of sawdust and 104,977 tons of other wood-waste from their own plants.

## Much Demand Leveled

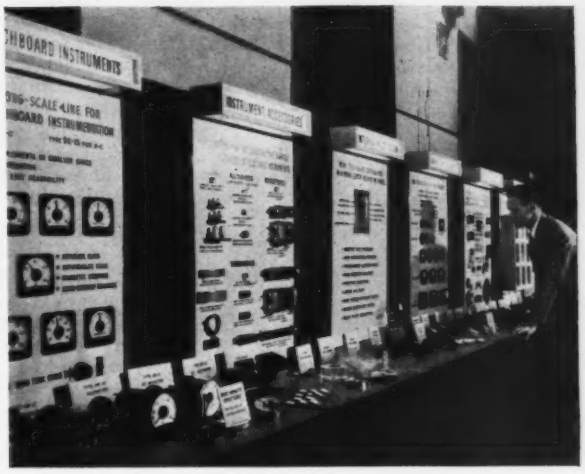
OTTAWA—Demands for most grades of paper, with the exception of newsprint and board, have leveled off and the "pressure to buy" has definitely slackened, according to the Export Division, Foreign Trade Service, Department of Trade and Commerce, Canadian Government. Even the supply-demand situation on kraft paper products has eased considerably in Canada.

Inventories of most grades and qualities of paper and boards in the hands of wholesalers, distributors, converters, retailers and consumers are adequate, this official report states. Many wholesalers of paper products are reported ready to reduce rather than to increase their stocks due to their ability to place orders and to obtain rapid delivery of supplies from most mills. Consensus is that supply, demand, inventories and prices of paper products have reached levels at which they will be able to keep pace with the over-all industrial activity.

The report draws attention to the fact that some high-cost paper mills in the United States, brought into production during the war, have been forced to close during recent months. A number of these, which were not integrated with their own pulp production, found European prices for pulp too high and were compelled to limit operations in some cases to the lower-priced domestic or Canadian market pulp.

## GENERAL ELECTRIC'S "CARNIVAL OF MEASUREMENTS"

**Pictured here are a few of the more than 150 electrically actuated measuring devices made by the G-E Meter and Instrument Divisions, West Lynn, Mass., which are in the mobile Instruments of Industry exhibit now touring U. S., industrial centers.**




## Indonesian Papermaking

Indonesians and Chinese own 178 small paper factories in the Republic of Indonesia, the Antata News Agency states, according to Foreign Commerce Weekly. Some 50 of these factories are located in the Kediri Residency and are formed into a cooperative. Seven establishments are reported to be in Magelang, 8 in Moentilan, and 10 in Jogjakarta; the others are located among the other residences. The total production of all these factories amounts to about 400 kilograms of writing and book paper, or an average of about 3 reams a day per factory. According to the chief of the Industrial Department of the Republic, the daily paper requirements of the Republic are 8,000 kilograms (17,640 pounds).

## Private Truck Owners

INDIANAPOLIS—Private truck operators of the nation will gather here January 27-28, to attend the 10th Annual Meeting of the National Council of Private Motor Truck Owners at the Hotel Claypool.

Said H. V. Haley, president of the Council headquarters of which are in the National Press building, Washington, D.C., "In many respects this will be the most important meeting in the history of our organization."

"Developments of the past few months", he continued, "have revealed a pattern of attack on private truck operations by highway and rail for-hire carrier interests which, if successful, would drive hundreds of thousands of industry-operated trucks off the city streets and country roads and create a transportation monopoly in favor of rails and common carrier trucks."

President Haley pointed to the Lenoir and Schenley cases, now pending before the Interstate Commerce Commission, in which he said the highway common carrier interests are demanding that the Commission place a fantastic interpretation on the word "compensation" in the Motor Carrier Act which would prohibit the recovery of the costs of delivery in pricing his merchandise by any one who uses a private truck.

Private Truck Owners of Indiana, will be host at a banquet January 27.

## Export Licenses Discarded

WASHINGTON — Bristol board, building paper and paper envelopes were freed of export license requirements to any part of the world in an action by Office of International Trade this week.

## Canadian Carloading

OTTAWA—Wood pulp and paper carloadings of revenue freight on Canadian railways comprised 18,900 cars in October 1948, the Canadian Government reports.

# ECA Authorizes Alpha Pulp for U. K.

WASHINGTON — ECA announced on November 15 that it had authorized procurement of $800,000 worth of industrial high alpha wood pulp for the United Kingdom, to be obtained in the United States.

This followed an earlier authorization on November 12 of procurement of $7,100,000 worth of woodpulp from Canada for the United Kingdom.

These and preceding authorizations of newsprint, woodpulp and related products under ECA, to be obtained in this country, or in countries from which the United States normally draws its own supplies, recall that exactly a year ago, when a European Marshall Plan committee first recommended that such materials and commodities be furnished to foreign nations under the European Aid program, and the recommendations were reported in *Paper Trade Journal* and elsewhere, the State Department officials concerned flatly denied to interested trade representatives that any such plan was afoot.

## Paper Dutiable Values

NEW YORK—Canadian wrapping paper with a decorative green stripe is before the authorities for classification, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry, the issue being whether it is dutiable as wrapping paper or under the special provisions for decorated, uncoated paper. The dutiable value of the paper is also in question.

New cases in the United States Customs Court include the following:

Corrugated paper, asphalted to a paperboard base, held dutiable at 35 percent as a manufacture of paper, is claimed to be dutiable at 30 percent as laminated paperboard; decorated fancy paper from France classified at four and one-half cents per pound and 20 percent is claimed to be dutiable as coated paper at five cents per pound and 15 percent; English serviettes, classified for duty at 35 percent as manufactures of paper, claimed to be dutiable at 30 percent as paper cut into shapes; Finnish paper classified as sulphite bond at three cents per pound and 15 percent, claimed to be dutiable as printing paper at one-fifth of one cent per pound and five percent.

## Holyoke's Steam Upped

HOLYOKE, Mass.—The new $1,100,000 steam turbine unit of the Holyoke Water Power Co., is now in operation, adding 15,000 kw steam power to the local utility's capacity, and bringing its total steam power to 42,500 kw.

Announcement of putting this new equipment into operation was made by President Robert E. Barrett, Jr., of the Holyoke Water Power Co., to the stockholders at their annual meeting, on November 15. Among the stockholders are representatives of most of the city's paper manufacturers, representing the century-old indentured water rights of the Holyoke paper mills.

At the same time, announcement was made that because of the lowest flow of water in the Connecticut River in the past 40 years, the company's net profit for the year ending September 30 dropped from $467,342 from the previous year, to $313,907. The diminished river flow lowered the income of the company from the sale of water power by nearly $100,000. In addition, the low water reduced the hydroelectric power generated by the company by 27 percent, a reduction which required a corresponding increase in the generation of electricity from fuel at an addition cost of about $138,000.

## Canadian Trade Balance

OTTAWA — The large balance of domestic exports over imports for consumption in the products of the pulp and paper industry is chiefly responsible for the important contribution of the wood and paper group of products to the $201,000,000 excess of total domestic exports over the total imports for consumption in Canada's foreign trade for 1947, the Canadian Government states in an official report here. The primary position taken by pulp and paper placed net exports of the wood, wood products and paper group at $797,000,000.

## Wages and Employment

OTTAWA — Average hourly earnings in the pulp and paper products manufacturing industries of Canada advanced to 104.7 cents at September 1 this year, compared with 103.9 on August 1 and 92 cents on September 1 a year ago, the Employment and Payrolls Branch of the Canadian Government reports in its latest survey, revealing that the average weekly salaries and wages in these industries rose to $47.84 at September 1 this year compared with $43.40 on the same date last year. The average hours per week reported at September 1 this year stood at 44.8, compared with 45.5 at August 1 and 46 on September 1 last year.

There were 117,663 employes reported at September 1 this year and weekly salaries and wages averaged a total of $5,629,541 on the same date. Employment in these industries stood at 146.1, 145.2 and 140.9 at September 1, 1948, August 1, 1948, and September 1, 1947, and payrolls stood at 234.8, 235.0 and 206.2 respectively, on the base of June 1, 1941, being equal to 100.

Distribution of persons recorded in these industries showed 81 percent men and 19 percent women at September 1, 1948, whereas on the same date of the previous year, men comprised 80.8 percent and women 19.2 percent.

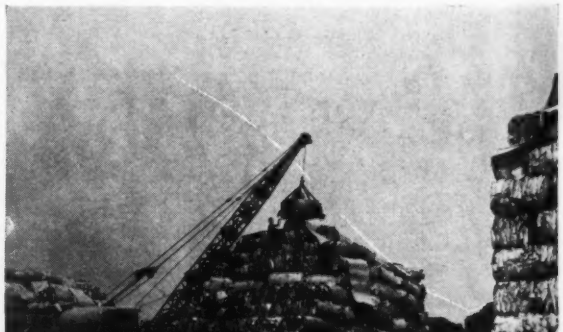
## Italy's Output Up

Production of wood pulp, paper, and paperboard for the first five months of 1948 reveals an increase over the corresponding period of 1947 according to current Italian statistics, Foreign Commerce Weekly reports. Available information indicates that June production probably exceeded the 1948 monthly average, although production still was very low compared with prewar averages. Wood-pulp production was 14,628 tons in the first five months of 1948, compared with 11,879 tons in the corresponding period of 1947, and paper and paperboard production was 109,255 tons as compared with 105,667 tons in the preceding year. Production indexes (average monthly basis, 1947=100) show that newsprint rose from 122 in January to 151 in May of this year.

Stocks of finished products were considered substantial as of June, and sales at reduced prices have been fairly active.

## THEW SELF-PROPELLED CRANE PILING STOCK

Alton Boxboard Co., Alton, Ill., finds self-propelled crane manufactured by Thew Shovel Co., Lorain, Ohio, makes easy work of unloading and stockpiling bales of straw and paper . . . Bales weighing 1,500 pounds each are readily handled by use of an ingenious clamp.



# TO ACT AS "BELTS"

**G-E wet-end helper drives for cylinder paper machines take the power transmission load off your felts, *improve* water removal, *lengthen* felt life, *cut* downtime!**

Your felts need no longer act as power transmission belts when your cylinder paper machines are equipped with G-E wet-end helper drives. By thus eliminating the need for high felt strength, which may impair the felt porosity and finish you want, these drives give you these outstanding advantages:

**GREATER TONNAGE because . . .**

- You get better water removal through use of a more open, porous felt, and you can take better advantage of latest felt-conditioning devices such as suction felt rolls, wringer rolls, etc.
- Less downtime is spent on felt washing and replacement.
- Increased over-all machine speed may be permitted by releasing horsepower from the line shaft drive.

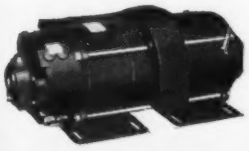
**LOWER COST PER TON OF BOARD because . . .**

- Longer felt life reduces felt costs.
- Better water removal at the wet end cuts steam costs.

**BETTER QUALITY CONTROL because . . .**

- Wider choice of felts, plus proper stretch and tension, affords improved control over a greater range of finishes.

G-E wet-end helper drives to increase the efficiency of your cylinder machines are fully described in a new bulletin, GEA-5130. Send for your copy today. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



**AMPLIDYNE EXCITER SET.** Units include a d-c amplidyne exciter—the heart of the regulating system—and an induction driving motor. Over 600 now in paper-mill use.

**OPERATOR'S PANEL.** This enclosed unit, mounted near the tending side of the machine, contains rheostats and ammeters for adjusting the helper motor loads.

**CONTROL PANEL.** May be mounted in the basement or elsewhere away from the machine. It includes protective devices and the amplidyne circuit components.

**PROGRESS**

ber of cylinder molds, extractor rolls, suction boxes, and primary presses. Today, the use of helper motors is common practice.

We are proud to be teamed up with such a progressive industry—an industry which has always been quick to stimulate and take advantage of new developments in electrical modernization. That kind of forward-looking attitude has been largely responsible for American industry's growth, and has made possible your progress and ours.

PAPER MILL *Drives*

GENERAL ELECTRIC

663-32

## AMERICAN PAPER AND PULP ASSOCIATION'S PRODUCTION RATIO REPORT*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

| Current Weeks—1948 | | Corresponding Weeks—1947 | |
|---|---|---|---|
| October 9 | 98.4 | October 11 | 108.4 |
| October 16 | 99.9 | October 18 | 108.3 |
| October 23 | 98.7 | October 25 | 111.2 |
| October 30 | 99.3 | November 1 | 111.1 |
| November 6 (Revised) | 97.0 | November 8 | 108.9 |
| November 13 | **100.8 | November 15 | 109.1 |

COMPARATIVE MONTHLY SUMMARIES

| 1947 | | | | | | 1948 | |
|---|---|---|---|---|---|---|---|
| Jan. | 102.1 | May | 106.2 | Oct. | 109.5 | | |
| Feb. | 105.9 | June | 106.2 | Nov. | 109.3 | Jan. | 100.3 |
| Mar. | 106.1 | July | 95.5 | Dec. | 101.5 | Feb. | 99.8 |
| Apr. | 105.1 | Aug. | 104.2 | | | Mar. | 100.8 |
| | | Sept. | 102.0 | Year Avg. | 104.3 | Apr. | 100.8 |
| | | | | | | May | 100.5 |
| | | | | | | June | 95.7 |
| | | | | | | July | ‡88.1 |
| | | | | | | Aug. | ‡96.8 |
| | | | | | | Sept. | ‡91.8 |
| | | | | | | Oct. | ‡99.1 |

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

| | 1941 | 1942 | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 |
|---|---|---|---|---|---|---|---|---|
| Year to Date | 96.8 | 91.7 | 88.4 | 88.5 | 89.4 | 101.3 | 104.3 | 97.2 |
| Year Average | 97.4 | 90.4 | 87.8 | 88.1 | 89.4 | 101.1 | 104.3 | |

** Indicates 1948 volume of 181,561 tons—Comparable week 1947—172,905 tons.

PAPERBOARD OPERATING RATIOS†

| Current Weeks—1948 | | Corresponding Weeks—1947 | |
|---|---|---|---|
| October 9 | 96 | October 11 | 102 |
| October 16 | 97 | October 18 | 101 |
| October 23 | 95 | October 25 | 101 |
| October 30 | 96 | November 1 | 100 |
| November 6 | 95 | November 8 | 102 |
| November 13 | 96 | November 15 | 101 |

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1947 | 99 | 103 | 101 | 100 | 101 | 101 | 90 | 99 | 96 | 101 | 99 | 89 | 98 |
| 1948 | 99 | 100 | 102 | 102 | 100 | 94 | 81 | 92 | 91 | | | | |

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

### English Newcomer

HAMILTON, Ont.—In its first entry into the Canadian field, the John Dickinson Co. of England, manufacturer of paper products, has selected this city as the location for its temporary plant and, later, for the erection of its main industry, P. W. Gordon, president of Consolidated Specialties Ltd., whose plant on Burlington Street East has been purchased by the English company, states.

The John Dickinson Co. (Canada) Ltd., would take over the staff of Consolidated Specialties, Mr. Gordon said.

The J. Dickinson Company has taken an option on 15 acres of land in the north-east industrial area, and while plans were described as "nebulous," it was speculated that the company's plant to be erected there might employ 1,000 or more persons.

The John Dickinson Company, Ltd., his nine mills in England, one in Australia and one in South Africa.

### Wage Hike Sought

HOLYOKE, Mass—Renegotiations for another pay increase for machine workers at the Stony Brook and Pearl City Divisions of the American Tissue Mills opened on November 8, with representatives of the concern and Eagle Lodge of Papermakers, AFL, meeting at the mill offices.

Negotiations were held last summer which resulted in a six-cents-an-hour increase, with a clause for an additional two-cents-an-hour jump on November 1, and the right to reopen negotiations for a further increase. The union has now taken advantage of the latter terms, and is asking for 10 cents an hour more.

### Metropolitan Office

SAN FRANCISCO—The Metropolitan Paper Products Co. has opened sales offices in the Hobart building, 582 Market street. S. B. Dutton is manager of the new office.

### Mott Expansion

ST. LOUIS—The Mott Carton & Paper Co., has completed the expansion of its facilities begun recently.

### B-F-D No. 5 Machine Started

PLATTSBURG, N. Y. — A fifth paper machine has been added to the facilities of the local mill of the B-F-D Division of the Diamond Match Co., increasing output of facial-type tissue by 25 tons daily. The paper will be converted by B-F-D into fine napkins and toilet tissue.

The machine, a 132-inch Yankee Foundrinier, was built by the Beloit Iron Works, Beloit, Wis. Engineering of the job was by the Charles T. Main Co. of Boston. The Merritt-Chapman & Scott Corp. of New York City was the contractor.

Bradford O. Preu, vice-president in charge of the B-F-D Division, and J. O. Julson, general manager of its paper and pulp operations, presided at ceremonies marking the formal start of the machine as a working unit.

### Hydro-Electric User

OTTAWA—The pulp and paper industry is the largest user of hydro-electric power in Canada, the Canadian Government reports, showing that in 1947 this industry used 12,289 million kilowatt-hours of electric energy, of which 9,973 million kilowatt-hours were purchased, the remaining 2,316 million generated in the plants of the industry itself.

About 35 percent of the purchased electricity was used for electric boilers. The cost of purchased electricity in 1947 amounted to $23,608,836, an increase of 1.1 percent over the previous year. Of the total amount, $4,118,420 was spent for use in electric boilers as compared with $5,373,508 in 1946.

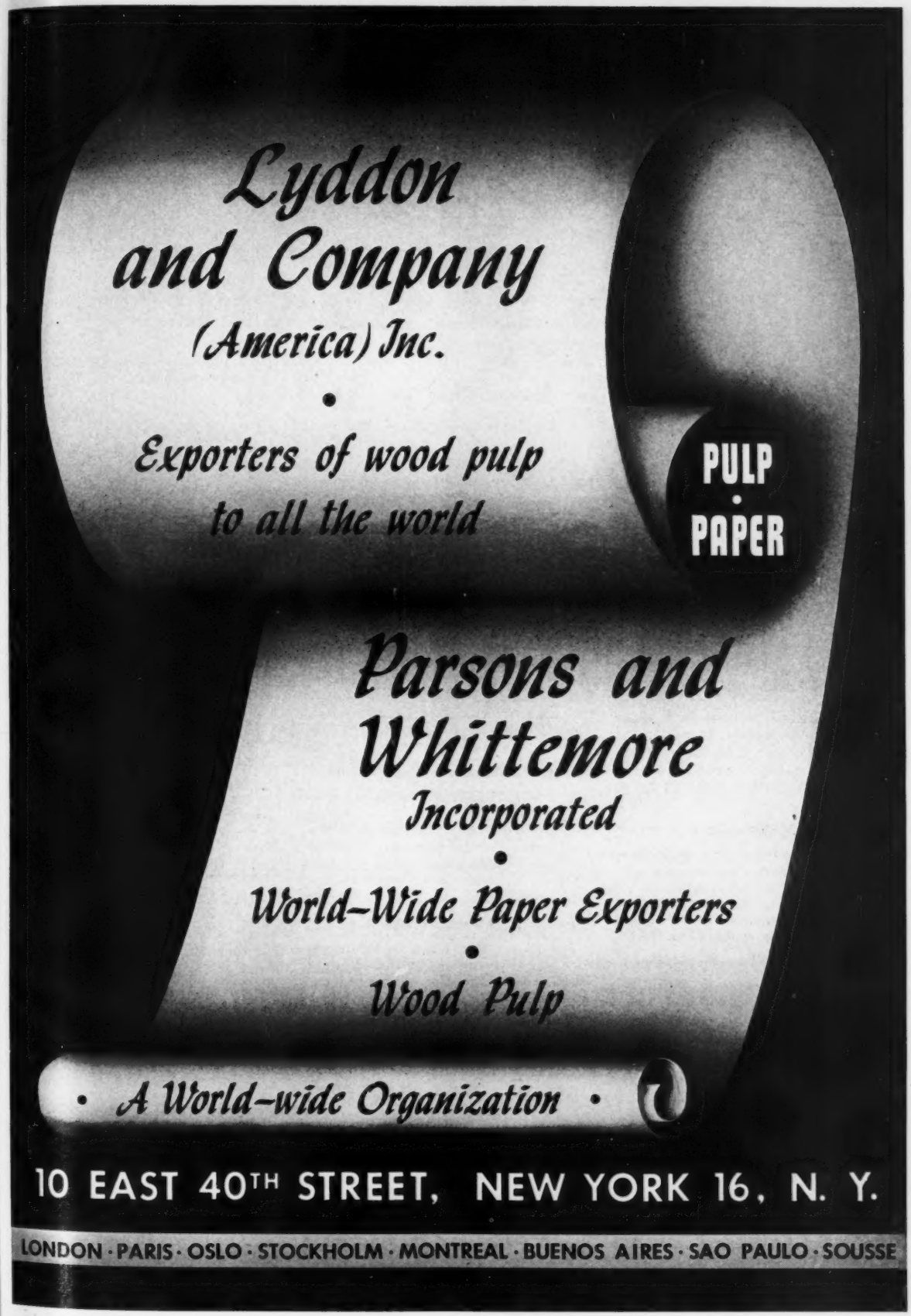
### Given Jail Sentence

NEW YORK—Max W. Federbush of 275 Central Park West, and his brother, Irving S. Federbush, of Great Neck, L. I., manufacturers of loose-leaf binders under the name of Federbush Co., Inc., 91 Seventh avenue, were sentenced to a year each in the city penitentiary on November 16 in Special Sessions on their pleas of guilty to falsifying state income-tax returns. The defendants were accused of failing to report at least $275,000 of corporate income and $300,000 of personal income. The charges covered the years of 1945 and 1946.

# Woodpulp Constituents, $231,668,229

OTTAWA — The total value of materials used in the manufacture of woodpulp in 1947 was $231,668,229, comprising 9,668,091 cords of pulpwood and other wood valued at $206,264,487 and chemicals, pulp stones and other materials and supplies worth $25,403,742, according to the Canadian Government's latest report here.

The total value of all materials going into the manufacture of paper in 1947 was $265,934,944. Of this amount $227,924,337 represented the cost of 5,585,061 tons of woodpulp, 5,249,369 tons of which, valued at $202,158,841, were made in combined pulp and paper mills for their own use in the manufacture of paper, and 335,692 tons, valued at $25,765,496, were purchased from Canadian pulp mills or imported. In addition, 100 tons of other wood fibre and 378,512 tons of other fibre and stock were purchased at a cost of $11,068,815. Chemicals, fillers, dyes, colors and other materials and supplies used were valued at $26,941,792.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## Foxboro Training Expanded

FOXBORO, Mass. — Plans for an enlarged program of instruction, with emphasis on the selection and application of correct instrumentation for specific industries, in addition to training in the use and maintenance of instruments in general, have been readied by the Foxboro Co. Courses scheduled in the program, which begins January 10, will deal with instrumentation in the pulp and paper and other industries.

Each course will include two weeks of study, classwork and shop practice, followed by three days devoted to the special problems of measurement and control in the processes of a specific industry.

The courses, primarily intended for process engineers and instrument maintenance men, are offered without charge to such men when sponsored by their respective companies. The courses are not for beginners, nor offered as an employment medium. Enrollment is limited, and applications should be made well in advance. For full information address: director of training, Foxboro Co., Foxboro, Mass.

## Newsprint Imports Drop

WASHINGTON — Newsprint imports into the United States in September fell to 699,000,000 pounds from 779,000,000 in August, the Department of Commerce reported late last week, based on Bureau of Census figures.

A corresponding decline was shown for woodpulp imports, to 155,000 tons from 179,000 in August. Exports of woodpulp from the United States in September were down to 423 short tons, from 7,733 tons in August.

Paper and paper manufactures exported in September were valued at $7,900,000, compared with $9,900,000 in August.

## Fantel SAPI Member

NEW YORK—Wm. Fantel, representing the Paper Corp., of America, 350 Fifth avenue, has been admitted to membership in the Salesmen's Ass'n., of the Paper Industry, E. G. Amos, secretary-treasurer, reports.

## Hart B. & J. Vice-President

NEW YORK—Allison B. Hart has been elected vice-president of the Berlin & Jones Co., Inc., envelope manufacturer. He was formerly general manager of the Chesebrough Mfg. Co., foreign department.

## Popp National Vet

HOLYOKE, Mass.—John T. Popp has been elected honorary president of the National Blank Book Co.'s Old Timers' Club. He has the longest active service record, 57 years, at National.

## Instructing the Children

JACKSONVILLE, Fla. — The National Container Corp. is one of several local firms sponsoring exhibits displayed during November in the Jacksonville Children's Museum.

## UK Procurement Expanded

WASHINGTON — Procurement of paper and paper products for the United Kingdom under the ECA program was expanded in further authorizations announced in the week ending November 20.

Included in latest authorizations were: an increase of $280,000 for kraft container board to be obtained from Canada, and an increase of $280,000 in the amount of kraft container board to be procured in the United States; and an increase of $1,250,000 in the amount of woodpulp to be procured in Canada, all for export to the United Kingdom.

## ECA Conditional Allotment

WASHINGTON—A conditional allotment to Sweden of $10,000,000 for procurement of goods and services to be delivered in the fourth quarter, 1948, and first and second quarters of 1949, has been announced by the Economic Cooperation Administration.

This is an additional amount over the $10,000,000 made available to Sweden in September for the third quarter of 1948. Sweden is expected to permit drawing against the equivalent in Swedish kroner when called on by the Bank for International Settlements, under the Intra-European payments agreement.

## Address Sales Execs.

NEW YORK — T. W. Prescott, assistant advertising manager of the Scott Paper Co., and J. D. Bowden, Jr., assistant retail sales manager, addressed the Eastern New York Federation of Sales Executives, November 16, at the DeWitt Clinton Hotel.

## Askania Names Sherbrooke

CHICAGO—Askania Regulator Co., has named Sherbrooke Machineries, Sherbrooke, Quebec, its Canadian representative for the pulp and paper industries. Sherbrooke maintains a sales office in Montreal, and representatives in Vancouver, B. C.

## Accident Prevention Exec.

HOLYOKE, Mass.—Harold V. Burgee, vice-president and general manager of the Parsons Paper Co., has been elected Holyoke vice-president of the Hampden County Accident Prevention Council, and chairman of the Holyoke Chapter.

## JESSOP UPS BRADBERRY

E. E. Bradberry has been named assistant manager of sales in Chicago, of the Jessop Steel Co., Washington, Pa. . . . H. A. Mawhinney is manager of sales. . . . Offices are at 332 South Michigan avenue.

## Taggart Modernization

WATERTOWN, N. Y. — William R. Adams, vice-president of the Taggart Corp., subsidiary of the St. Regis Paper Co., reports that the company's kraft paper mill at Oswego will be closed for an eight-week period, starting Nov. 28, to permit installation of new equipment on the paper machine.

The equipment, which includes a new electric drive and a new press section, constitutes a final step in a $750,000 program for this mill begun at the end of the war. It is expected to increase the capacity of the machine by approximately 20 percent, or from 150 to 180 tons daily.

## Street Halts Plant

MORRIS TOWNSHIP, N. J. — An ordinance to vacate Bonsell place for the Mid-States Gummed Paper Corp. and accept a 50-foot right of way adjoining the vacated street from private sources was introduced on November 15 by the Township Committee.

John D. Collins, attorney, who has been working for more than six months to clear title in the site, said vacation of the street and acceptance of the adjacent strip will complete sale of the property and allow construction of buildings for the concern.

## Gifford Joins Mathieson

NEW YORK — Henry Gifford has joined the heavy chemical sales division of the Mathieson Chemical Corp. with headquarters in Chattanooga,. He will cover Tennessee and adjoining states. He was previously with the Allied Chemical & Dye Corp.

## New Taylor Trio

ROCHESTER, N. Y.—Taylor Instrument Co.'s., has added William Eaton, Robert Campbell and Robert McCaughan to its sales staff, working out of Schenectady, Milwaukee and Detroit, respectively.

## Water Power Plant

MADISON, Maine—The Great Northern Paper Co., is reported to have bought the water power plant and the big wooden building of the idle Madison Woolen Co.

## Eddy Blaze Snuffed

OTTAWA—A major fire was averted by prompt action of fire-fighters who quickly extinguished a threatening blaze that broke out in the motor room of E. B. Eddy Co., Ltd., recently.

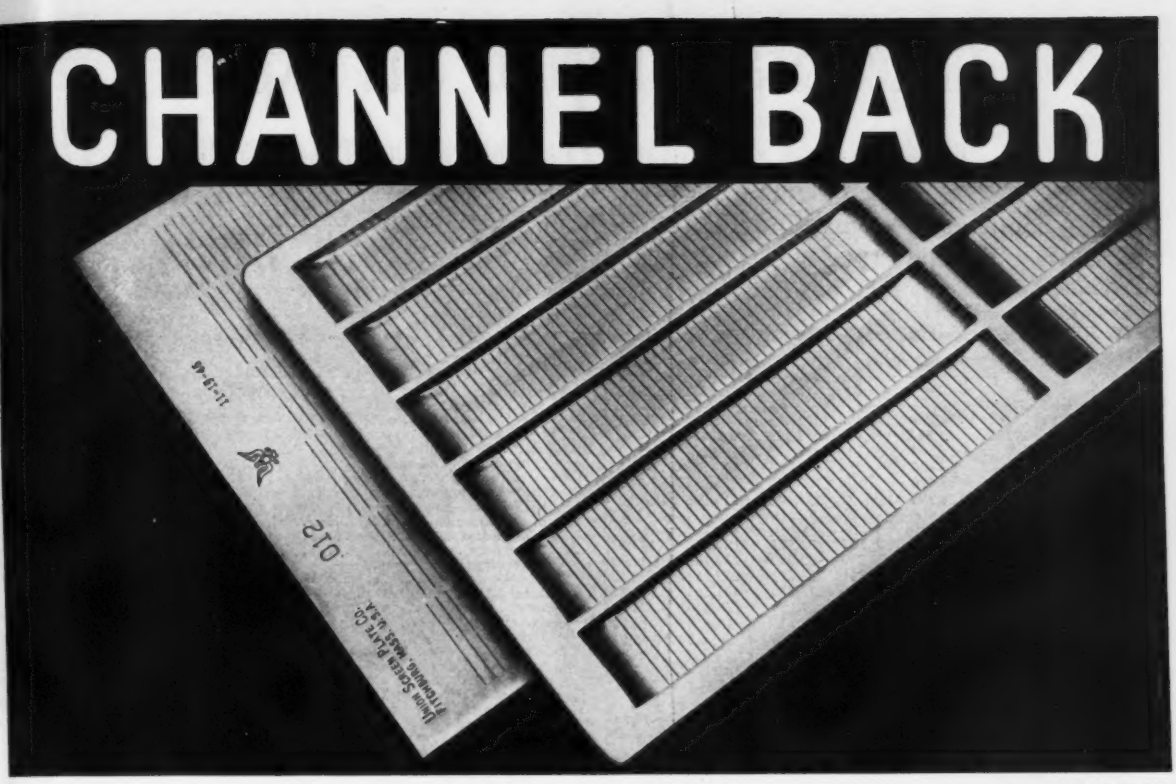
## Powell's No. 8 Machine

VANCOUVER, B. C. — The Powell River Co., Ltd., has issued a handsomely prepared and illustrated brochure describing and picturing its new No. 8 newsprint machine.

## Plunkett to Columbia

PITTSBURGH—James C. Plunkett has been named assistant advertising manager of the Columbia Chemical Division of the Pittsburgh Plate Glass Co.

# CHANNEL BACK




U. S. PAT. NO. 2,419,155

# The Modern Bronze Screen Plate

- Channel construction maintains slot stiffness
  - Stringing and clogging of slots greatly lessened
    - Slot area increased compared to old style plates
      - Sufficient strength for use on any screen equipment
- Weight of plate reduced for ease in handling
  - Amount of plate cleaning needed held to minimum
    - Plate inspection and maintenance made easier
      - Takes chromium or nickel plating more readily
- Plate has six channels and four cross-truss ribs
  - Supplied with 4 to 8 slots per inch, cut .006" and up
    - Standard dimensions are $\frac{3}{8}$" thick by 42" or 43" long
      - Available in both drilled and Witham-bevelled types

A TRIAL ORDER IS THE BEST PROOF

## UNION SCREEN PLATE COMPANY

FITCHBURG MASSACHUSETTS

# United States Imports and Exports

## Pulpwood, Wood Pulp, Paper, Paperboard and Paper Products

### September, August and First Nine Months of 1948—Preliminary Figures

(In short tons except where otherwise indicated)

**IMPORTS**

| Item | September 1948 | September 1947 | August 1948 | First 9 months 1948 | First 9 months 1947 |
|---|---|---|---|---|---|
| Pulpwood, total (in cords of 128 cu. ft.) | 192,038 | 190,315 | 211,473 | 1,586,761 | 1,375,291 |
| Rough | 93,743 | 116,446 | 115,495 | 735,736 | 743,156 |
| Peeled | 95,129 | 71,547 | 87,674 | 785,276 | 577,129 |
| Rossed | 56 | 216 | 54 | 738 | 459 |
| Chipped | 3,110 | 2,106 | 8,250 | 65,011 | 54,547 |
| Wood Pulp, total | 154,783 | 186,631 | 179,342 | 1,719,505 | 1,710,314 |
| Bleached, sulphite, rayon and special chemical grades | 24,164 | 20,727 | 23,571 | 189,038 | 179,935 |
| Bleached sulphite, other | 25,232 | 23,310 | 22,999 | 239,708 | 213,299 |
| Unbleached sulphite | 40,698 | 54,311 | 55,711 | 539,283 | 556,594 |
| Bleached sulphate | 25,032 | 21,301 | 23,669 | 221,305 | 170,874 |
| Unbleached sulphate | 14,999 | 37,060 | 27,159 | 278,630 | 346,635 |
| Soda pulp | 1,899 | 1,864 | 2,255 | 18,422 | 14,906 |
| Chemical screenings | 440 | 685 | 288 | 6,622 | 6,939 |
| Bleached groundwood | ..... | ..... | ..... | ..... | ..... |
| Unbleached groundwood | 21,905 | 26,934 | 23,264 | 223,119 | 217,555 |
| Groundwood screenings | 414 | 439 | 426 | 3,378 | 3,577 |
| Waste Fibrous materials, total | 7,156 | 5,804 | 7,886 | 75,059 | 50,987 |
| Rags for paper stock | 763 | 782 | 1,394 | 16,568 | 8,929 |
| Other pulp, rag, straw, esparto, etc. | 4 | ..... | ..... | 4 | 31 |
| Other waste fibrous materials | 6,389 | 5,022 | 6,492 | 58,487 | 42,027 |
| Paper, paperboard and paper products, total | 363,475 | 368,480 | 405,913 | 3,349,076 | 3,020,490 |
| Paper and paperboard, total | 362,962 | 368,225 | 405,498 | 3,344,447 | 3,016,907 |
| Paper, total | 357,791 | 364,141 | 399,464 | 3,287,397 | 2,973,420 |
| Newsprint | 349,476 | 357,998 | 389,729 | 3,207,036 | 2,897,451 |
| Printing, and book paper, uncoated | 7,343 | 5,059 | 7,940 | 62,120 | 57,623 |
| Fine paper, total | 39 | 36 | 42 | 471 | 594 |
| Writing paper | 6 | 10 | 9 | 86 | 68 |
| Cover paper | ..... | ..... | ..... | 1 | (1) |
| Bristols | 7 | (1) | 1 | 12 | 2 |
| Thin paper | 23 | 23 | 28 | 336 | 461 |
| Other fine paper | 3 | 3 | 4 | 36 | 63 |
| Wrapping, bag, and converting paper, total | 854 | 1,013 | 1,722 | 16,142 | 16,435 |
| Greaseproof | (1) | ..... | (1) | 29 | 51 |
| Vegetable parchment | ..... | ..... | 1 | 12 | 5 |
| Kraft wrapping | 565 | 832 | 1,226 | 8,768 | 6,708 |
| Wrapping, except kraft | 289 | 181 | 495 | 7,333 | 9,671 |
| Tissue and crepe paper | 23 | 13 | (1) | 1,258 | 812 |
| Absorbent paper | 42 | 2 | 1 | 90 | 41 |
| Building paper | 14 | 20 | 30 | 280 | 464 |
| Paperboard, total | 5,171 | 4,084 | 6,034 | 57,050 | 43,487 |
| Kraft container board | ..... | ..... | ..... | 604 | ..... |
| Other container and boxboard | ..... | 5 | ..... | 25 | 2,745 |
| Other paperboard | 3,443 | 1,073 | 4,028 | 33,298 | 15,393 |
| Fiber insulation board | ..... | 133 | ..... | 187 | 1,202 |
| Wall board | 1,728 | 2,873 | 2,006 | 22,936 | 24,147 |
| Paper products | 513 | 255 | 415 | 4,629 | 3,583 |

**EXPORTS**

| Item | September 1948 | September 1947 | August 1948 | First 9 months 1948 | First 9 months 1947 |
|---|---|---|---|---|---|
| Pulpwood (in cords of 128 cu. ft.) | 340 | 4,203 | ..... | 33,377 | 66,905 |
| Wood pulp, total | 423 | 11,603 | r7,733 | 71,473 | 95,394 |
| Bleached sulphite, rayon and special chemical grades | 386 | 1,092 | r1,531 | 12,387 | 8,473 |
| Bleached sulphite, other | ..... | 3,215 | 696 | 13,815 | 32,272 |
| Unbleached sulphite | 20 | 4,215 | 4,760 | 38,192 | 41,943 |
| Bleached sulphate | ..... | 250 | ..... | 626 | 2,182 |
| Unbleached sulphate | ..... | 2,831 | 703 | 5,084 | 8,076 |
| Soda pulp | ..... | ..... | ..... | 534 | 569 |
| Screenings and other wood pulp | 17 | ..... | 43 | 835 | 1,879 |
| Waste fibrous materials, total[1] | 10,145 | 13,260 | 11,649 | 118,958 | 130,999 |
| Overissue news | 700 | 1,267 | 3,659 | 17,535 | 28,085 |
| Other waste paper | 8,251 | 10,833 | 6,380 | 87,171 | 90,928 |
| Rags for paper stock; valued at $50 or over per ton | 83 | 205 | 213 | 2,528 | 2,812 |
| Rags for paper stock; valued under $50 per ton | 692 | 739 | 760 | 7,163 | 6,126 |
| Other paper stock | 419 | 216 | 637 | 4,561 | 3,048 |
| Paper, paperboard and paper products, total | 29,233 | 41,164 | 37,098 | 302,470 | 349,800 |
| Paper and paperboard, total | 22,209 | 31,990 | 27,925 | 223,987 | 259,988 |
| Paper, total | 10,563 | 17,500 | 13,712 | 125,061 | 158,802 |
| Newsprint | 1,899 | 2,115 | 2,179 | 21,184 | 20,598 |
| Book paper, uncoated | 3,496 | 4,501 | 4,680 | 36,636 | 39,268 |
| Fine paper, total | 2,528 | 5,002 | 3,261 | 33,888 | 51,228 |
| Writing paper | 1,768 | 3,526 | 2,226 | 21,664 | 35,400 |
| Cover paper | 119 | 303 | 82 | 888 | 2,580 |
| Bristols | 132 | 478 | 323 | 4,237 | 4,505 |
| Cigarette paper | 509 | 695 | 630 | 7,099 | 8,743 |
| Wrapping, bag, and converting paper, total | 1,626 | 3,762 | 2,245 | 21,664 | 31,343 |
| Greaseproof and waterproof paper | 530 | 995 | 564 | 6,878 | 10,547 |
| Wrapping, except kraft | 318 | 1,082 | 701 | 7,092 | 11,834 |
| Kraft wrapping | 778 | 1,685 | 980 | 7,694 | 8,962 |
| Tissue and crepe paper | 298 | 561 | 476 | 3,855 | 5,849 |
| Blotting paper | 273 | 455 | 173 | 2,084 | 3,452 |
| Sheathing and building paper | 443 | 1,104 | 698 | 5,750 | 7,064 |
| Paperboard, total | 11,646 | 14,490 | 14,215 | 98,926 | 101,186 |
| Kraft container board | 5,323 | 5,033 | 8,463 | 40,742 | 34,806 |
| Other container and boxboard | 616 | 1,580 | 1,078 | 6,050 | 9,167 |
| Other paperboard | 3,876 | 3,657 | 1,664 | 24,862 | 26,414 |
| Fiber insulation board | 682 | 3,063 | 1,591 | 13,861 | 21,252 |
| Wallboard | 1,149 | 1,157 | 1,417 | 13,411 | 9,547 |
| Paper products, total | 7,024 | 9,174 | 9,173 | 78,483 | 89,812 |
| Surface-coated paper | 539 | 1,819 | 563 | 9,971 | 16,042 |
| Toilet paper | 588 | 569 | 525 | 5,468 | 5,848 |
| Paper towels and napkins | 98 | 142 | 172 | 1,511 | 1,550 |
| Filing folders, index cards, and other office forms | 127 | 113 | 93 | 1,414 | 1,195 |
| Papeteries | 1 | 18 | 2 | 48 | 366 |
| Wallpaper | 2 | 58 | 5 | 78 | 576 |
| Shipping sacks | 1,864 | 1,765 | 3,569 | 17,779 | 14,263 |
| Paper bags | 796 | 707 | 638 | 5,315 | 8,108 |
| Shipping containers | 533 | 730 | 333 | 6,926 | 6,701 |
| Boxes and cartons | 405 | 546 | 675 | 4,053 | 5,421 |
| Envelopes | 39 | 96 | 73 | 671 | 982 |
| Cash-register and adding machine paper | 326 | 481 | 207 | 3,092 | 3,162 |
| Other paper and products | 1,706 | 2,130 | 2,318 | 22,157 | 25,598 |

[1] Less than one-half ton.

r Revised; subject to further revision.

Note: Figures are preliminary; subject to revision.

Source: Prepared in the Forest Products Branch, Office of International Trade. Data from the Bureau of the Census, United States Department of Commerce.

## Belgian Congo Potential

OTTAWA — There is a possibility of Canada augmenting sales of newsprint and other paper products in Angola, states L. H. Ausman, Canadian Government Trade Commissioner in Belgian Congo.

Executive Ass'n. Mr. Burke has been a member of ATAE for 25 years.

## Canadian Car Loadings

OTTAWA—Car loadings on the Canadian railways from the first week of this year until the week ending October 30th involved a cumulative total of 187,362 cars of woodpulp and paper compared with 182,020 cars in the similar period last year ending November 1, 1947, the Canadian Government reports.

# Performance of a Whole Log Chipper and Associated Equipment*

By D. J. MAC LAURIN and A. M. VAN ALLEN

**Abstract**

*Data are presented on the performance of a 123-inch whole log chipper, screens and rechipper used in converting large barked logs, into chips for pulping. The equipment converts approximately 97 percent of barked log weight into suitable chips, at an average production rate of 40 tons wet weight chips per hour, with 7 percent saving in wood and a 50 percent saving in labour over former 84-inch chippers and associated equipment.*

The importance of the most economic use of the pulp and paper industry's key raw material, wood, has increased steadily over the past years. This trend has caused intensive search for improved methods of wood preparation for the various pulping processes. The development of hydraulic barkers, and on the Pacific Coast, the whole log chipper, are results of this search.

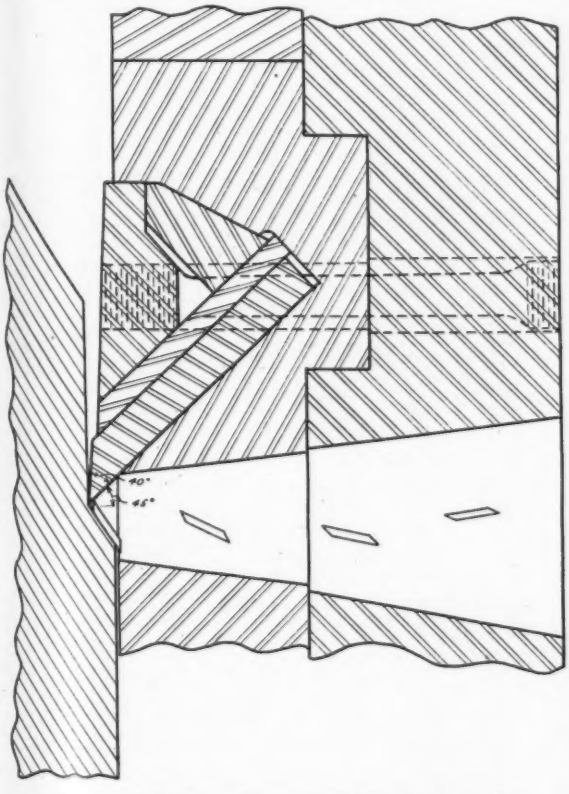



Figure 2—Whole Log Chipper Knife Mounting Assembly

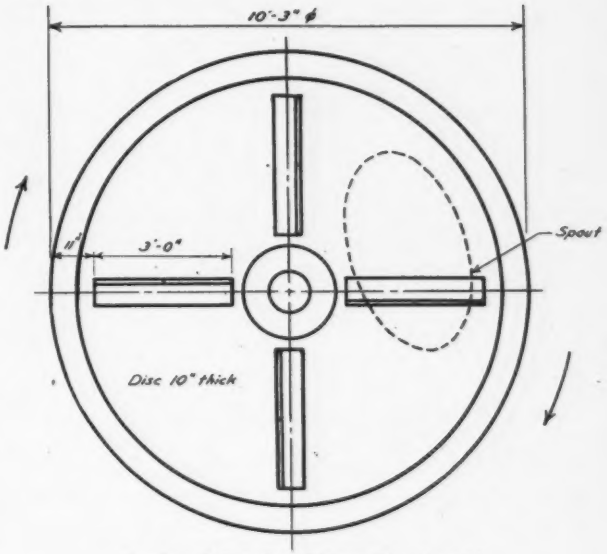



Figure 1—Whole Log Chipper Disc Assembly

As one phase of a program in keeping with a policy directed at more economical use of wood, the Powell River Co., Ltd., has recently completed a major revision of its wood preparing equipment. This revision included the installation of hydraulic barkers and a whole log chipper. One Weyerhaeuser type barker was installed for normal pulp logs, and one Allis-Chalmers type stream barker, for the smaller logs, which otherwise would perhaps be classed as "forest waste." The installation and arrangement of this equipment was fully described by Stewart *(1)*.

This paper is primarily a presentation of data on the performance of the whole log chipper and associated equipment used at Powell River in the preparation of sulphite chips.

## CHIP-PREPARING EQUIPMENT

Suitable size logs of the desired species are selected from those barked in the Weyerhaeuser barker and chipped in a Waterous whole log chipper. The resulting chips are screened on Orville Simpson Rotex screens. From the screens, the accepted fraction is conveyed, either direct or via storage, over a Merrick weightometer to bins above the digesters. The oversized fraction is returned to the screen feed through a rechipper in a closed circuit. The under-sized fraction is collected from a hopper under each screen by a common belt and passed to the main hog fuel conveyor.

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* A paper read at the Spring sessions of the Western Branch, Technical Section, Canadian Pulp & Paper Ass'n., Ocean Falls, B.C., May 26-27, 1948.

[1] Central Superintendent, Powell River Co., Ltd.
[2] Technical Assistant, Sulphite Dept., Powell River Co., Ltd

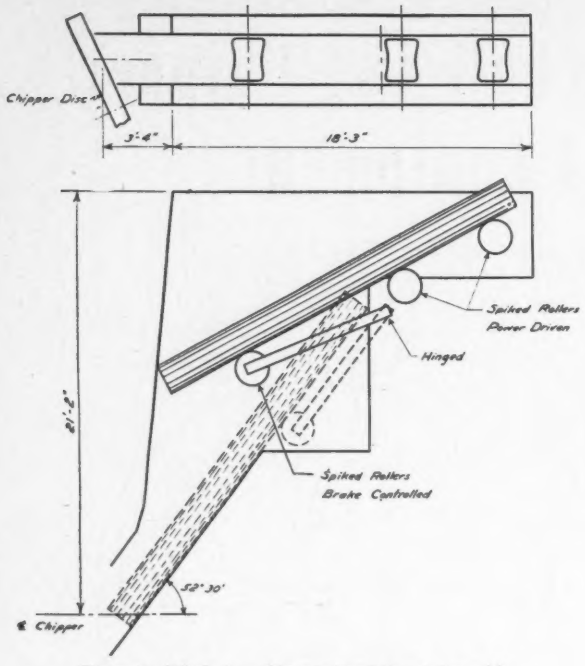



Figure 3—Whole Log Chipper Feed Spout Assembly

### The Whole Log Chipper

The whole log chipper is a four-bladed, 123-inch disc diameter, Waterous, as shown in Figure 1. The disc is 10 inches thick and has four, 3-inch-thick wear plates, each covering a full quadrant, set into the face. A 500 HP, 250 RPM, wound rotor induction motor drives the disc clockwise, viewed from the feed spout. This drive was selected in preference to a synchronous motor for the purpose of avoiding any undesirable effects that consequent higher peak power demands might have had on paper machine drive performance. Two 16¾-inch knives form a blade. The knives are mounted as shown in Figure 2. All eight knives are changed at the beginning of each shift. This takes about 15 minutes. No filing or hand sharpening of the knives is done during the eight-hour shift. This knife changing and sharpening schedule was chosen only for immediate convenience and the establishment of an optimum procedure is pending. Data on power consumption is not yet available because of delayed delivery of the required recording watt-hour meter. However, such data as could be obtained with an indicating watt-hour meter indicate unit power consumption higher than that reported elsewhere *(2) (3)*.

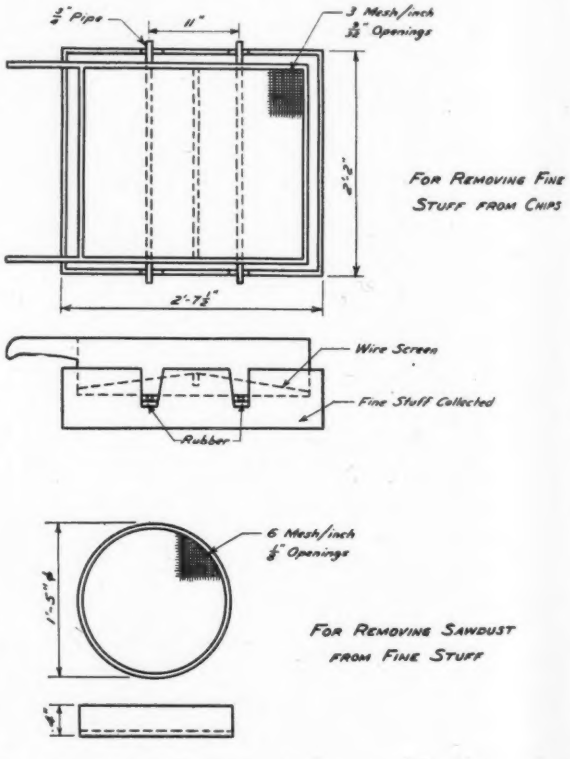
This chipper handles logs up to 26 inches in diameter and perhaps 40 feet in length, though other equipment limits the length of logs presently chipped to about 26 feet. It is operated by one man. The maximum theoretical capacity of the chipper, at 250 RPM with logs of 17 inches in diameter, is 31 M BCLS (62 cords) per hour. The observed maximum production is about 23 M BCLS (45 cords) per hour or 57 tons of 50 percent bone dry chips. This difference between theoretical and observed capacity is considered due to slower average speed, time lost in loading and non-continuity of feed in the last quarter of the log caused by its bouncing.

The vibration caused by bouncing of the last quarter of the log in the spout has led to some mechanical failure. During about seven months operation a few bed bolts have failed and a slight end-play has developed in the disc shaft. The removable face wear plates have worn about ⅛th of an inch, and when necessary it is planned to replace the existing wear plates with a chromium plated set.

In operation, logs from the storage deck in the chipper building are fed endwise by means of a concave spike-roll into the 25-foot feed and spout assembly, the long axis of which is oriented 55 degrees to the horizontal and 60 degrees to the chipper disc and intersects a radius at about 2 o'clock on the disc face. The logs are received first by an apron which is hinged to the top end of the spout, and then as the apron is lowered, are fed slowly up to the rotating disc. The rate of approach of the log to the disc, except for the last two or three feet, through which they fall freely, is controlled by the operator by means of an air braked, spike roll at the lower end of the apron. A 24-inch diameter, 26-foot log is reduced to chips within 26 seconds after it first meets the knives. The chips are discharged through the chipper base onto a 4-foot-wide H type chain conveyor from which they fall onto a 4-foot-wide rubber belt travelling at 600 feet per minute uphill at an angle of 20 degrees, and conveyed to the chip screen room. Figure 3 shows the feed spout and lowering apron assembly.

### Chip Screens and Rechipper

A wide flight conveyor receives chips from the 4-foot-wide rubber belt. This conveyor is located above five, 1,000 cu. ft. storage bins, of timber construction. Spe-




Screens Used for Chip Quality Evaluation

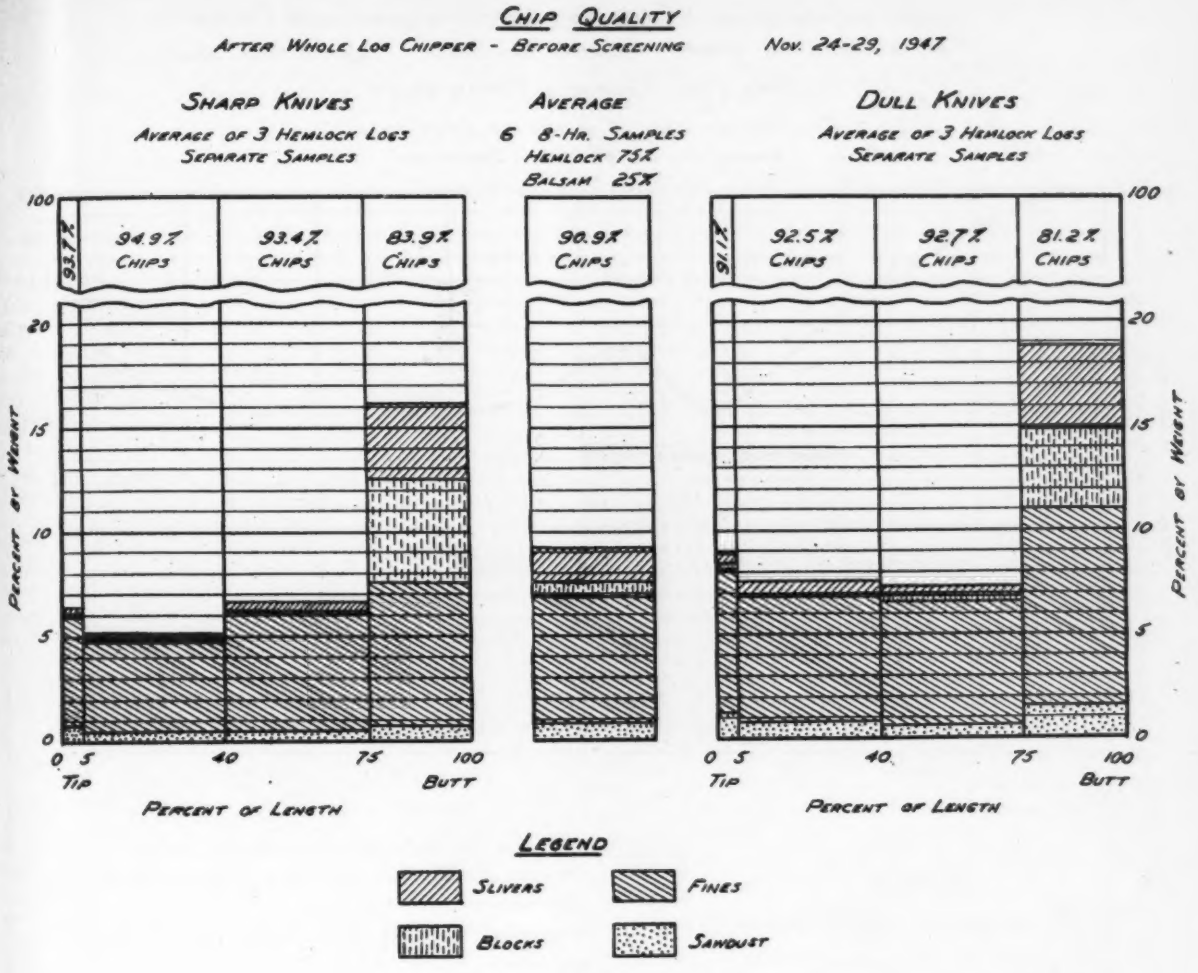



Chart I

cial gates are located in the bottom of this conveyor and are adjusted so that the chips will be distributed equally into the bins. To insure uniform feed rate and distribution across each screen, the chips are transferred from the storage bins to the screens by horizontal rotating fluted roll type chip feeders.

The screens are Orville Simpson Rotex, equipped with an upper screen plate with 1½ inch square openings at 2-inch centres, and a lower screen wire of 6 meshes per inch. The accepted fraction (97 percent) is conveyed by a 3-foot-wide rubber belt conveyor travelling at 600 feet per minute, at a maximum uphill angle of 17 degrees, either direct, or via a storage bin, over a Merrick weightometer to chip bins over the digesters. About one percent of original feed does not pass the coarse top screen plate and is returned to the feed through a 50-inch four bladed chipper which serves as a rechipper. The fine screen passes about three percent of the feed. This fraction is used as hog fuel.

## PERFORMANCE DATA OF EQUIPMENT

The performance of the whole log chipper, the screens and the rechipper have been evaluated separately. Also their performance as a unit has been determined. In addition a study has been made of the effect of knife condition, disc speed, log bounce, and the spraying of water on the knives during chipping, on chipper performance.

### Sampling Procedure

Throughout these studies, chip quality was determined by a standard test procedure as described in Appendix "A". It is noted that in this procedure, and consequently in all Tables in this paper, "chips" are defined as that portion of the accepted fraction from the chip screens remaining, when slivers, blocks, knots and bark are removed by hand, which is retained on a 3-mesh hand screen; "fines" as that portion which passes a 3-mesh but is retained by a 6-mesh hand screen; and "sawdust" as that portion which passes a 6-mesh hand screen. "Chips" are considered suitable and desirable for pulping, "fines" are considered fairly suitable but not desirable, and "sawdust" is considered undesirable. Representative samples drawn from composite samples were used in all cases for chip quality evaluation, except when individual logs were being considered. The composites were obtained by compounding grab samples of approximately one pound each, drawn at 10 minute intervals over a 7-hour period, from the free falling discharge of chips from the appropriate belts. Samples from points along individual logs were obtained by start-

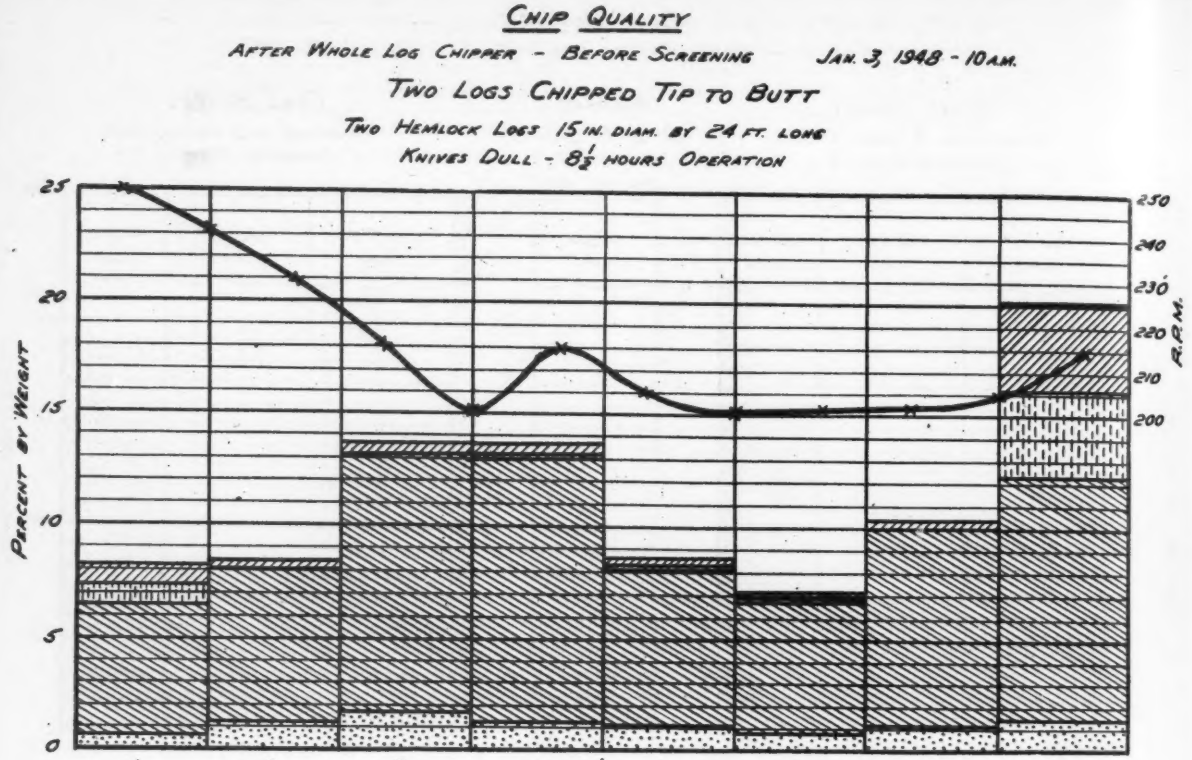



Chart II

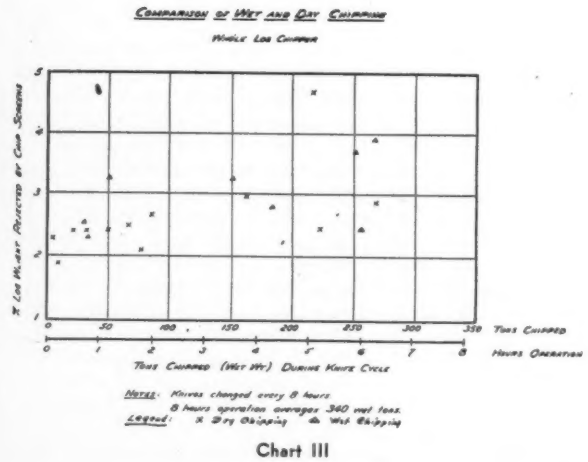

COMPARISON OF WET AND DRY CHIPPING
WHOLE LOG CHIPPER
% LOG WEIGHT REJECTED BY CHIP SCREENS
TONS CHIPPED
HOURS OPERATION
TONS CHIPPED (WET WT.) DURING KNIFE CYCLE
NOTES: Knives changed every 8 hours
8 hours operation averages 340 wet tons
LEGEND: X Dry Chipping Wet Chipping

Chart III

ing to chip a log onto an empty running belt, then stopping the belt as soon as the log was chipped and taking grab samples at desired points from the laid out, chipped log. The amount of sawdust passed by the screens was measured volumetrically, and a weight per unit volume established. Accepted chips were weighed on a Merrick weightometer. The total amount of oversize material rejected by the screen was determined by weighing the amount passed for a 20-minutes period in each hour. The determination of percent "matchsticks" in sawdust was done by handsorting representative 2,000 gram samples of sawdust. Any piece in the sawdust over ½ inch long was called a "matchstick".

**Performance of the Whole Log Chipper**

The overall average quality of chips from the whole log chipper when operating normally, was determined, and the data are given in Tables I and II, and Chart 1. In general the average quality of unscreened chips produced by the whole log chipper was found to be superior to that produced by the old 84-inch diameter, 3-knife chippers. Particularly, the uniformity is better, and slivers and blocks are reduced. The whole log chipper

**TABLE I Breakdown of Weight of wood fed to the Whole Log Chipper**

(expressed as percentages of the log weight)

| | Coarse Stuff | | Fine Stuff | | | To Hog Fuel | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | "Sawdust" | | Overs | |
| | Slivers | Blocks | Fines | Sawdust | Chips | Match-sticks | Smaller than Matchsticks | Suitable as Chips | Not Suitable as Chips |
| Before Screens | 1.4 | 0.2 | 10.4 | 1.8 | 86.2 | .. | .. | .. | .. |
| After Screens Rechipper Operating | 0.6 | 0.6 | 8.6 | 0.3 | 86.2 | 1.4 | 1.8 | .. | .. |
| After Screens Rechipper Not Operating | 0.9 | 1.1 | 8.6 | 0.4 | 84.7 | 1.3 | 2.0 | 0.3 | 0.7 |

Note—*Matchstick:* Samples of the "sawdust" fraction from the screens were handsorted and any piece longer than ½" was called a matchstick.

however produces somewhat more "fines" than did the old chippers. The former chippers gave from five to seven percent, and the whole log chipper gives from eight to ten percent. The whole log chipper converts an average of 1.8 percent of log weight into sawdust.

The quality of chips produced at different points along a log was also determined. Table IV and Charts I and II record the data obtained. In general, for a single log, quality is a little below average for the first five percent of the log and noticeably below average over the last 25 percent, where sliver and block fractions were found to be higher than average. This finding and observation led to the hypothesis that bouncing of the log during chipping of the last portion of it, could be the cause of lower than average chip quality from that portion of the log. This hypothesis was tested by running a pair of logs through the chipper, the second bearing on the end of the first, thus minimizing bouncing of the last portion of the first. Evaluation of chip quality at points along both of these logs, showed the hypothesis correct, and hence it was concluded that bouncing of the last portion of a log during chipping was the cause of excess slivers and blocks from that portion of the log. This operation also established the fact that chip quality was independent of disc speed over the range, 200 to 250 RPM. Chart II shows the data from which these conclusions were drawn.

### Acid Susceptibility of Unscreened Chips

The undesirable acid susceptibility of chips as defined by Yorston *(4)* is a measure of the amount of compressed or "damaged" wood in the chips. The main source of compressed wood in chips is the shearing and bending of the wood by the chipper knives. Acid susceptibility is determined by removing all the brittle fibres found in the chips after they have been covered with the cold five percent nitric acid, and then heated at 80°C for six hours. It was found that chips from the whole log chipper contained approximately 13 percent acid susceptible wood. Previous similar work in 1943 on chips from the small chippers with 32-inch wood showed 16 to 20 percent acid susceptible wood. Thus the whole log chipper produces less acid susceptible wood than the former chippers, with consequent minimizing of pulp strength and yield losses, considered attributable to this condition.

### Effect of Knife Condition

The sharpness or dullness of the chipper knives was found to affect average chip quality. In general, dull knives significantly increase production of fines and sawdust, and accentuate the production of lower than average quality chips in the last portion of a log. Data supporting these conclusions are given in Tables III and IV and Charts I and III.

### Water Lubrication of Chipper Knives

The use of water on the chipper knives during use, a procedure followed at some Pacific Coast Mills, was investigated as a possible method of reducing the average percent of fine stuff produced. Results showed that the quantity of sawdust produced by either dull or sharp

**TABLE II Average Chip Quality**

(Values are expressed as percents of sample)

| Date | Coarse Stuff | | Fine Stuff | | Chips | | % Chip-Length Distribution | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Slivers | Blocks | Fines | Sawdust | | Avg. Length | | | | | |
| | % | % | % | % | % | inches | —1¼" | 1"-1¼" | ¾"-1" | ½"-¾" | ¼"-½" |
| (a) *Before Screenings* | | | | | | | | | | | |
| February 16, 1948..... | 1.3 | 0.3 | 14.0 | 3.1 | 81.3 | 0.77 | 0 | 12.0 | 38.8 | 42.3 | 6.9 |
| February 17, 1948..... | 1.1 | 0.2 | 11.1 | 1.7 | 85.9 | 0.74 | 1.5 | 7.4 | 41.4 | 41.5 | 8.2 |
| February 18, 1948..... | 2.2 | 0.1 | 8.7 | 1.6 | 87.4 | 0.78 | 0.8 | 3.6 | 56.6 | 35.0 | 4.0 |
| February 20, 1948..... | 1.4 | 0.1 | 10.5 | 0.8 | 87.2 | 0.70 | 1.7 | 0.6 | 37.5 | 47.4 | 12.8 |
| February 21, 1948..... | 1.2 | 0.2 | 7.5 | 1.9 | 89.2 | 0.70 | 0 | 3.6 | 29.1 | 57.6 | 9.7 |
| Average ..... | 1.4 | 0.2 | 10.4 | 1.8 | 86.2 | 0.74 | 0.8 | 5.4 | 40.7 | 44.8 | 8.3 |
| (b) *After Screening—Rechipper Operating* | | | | | | | | | | | |
| February 16, 1948..... | 0.6 | 0.2 | 13.7 | 0.4 | 85.1 | 0.75 | 1.5 | 4.5 | 39.0 | 49.1 | 5.9 |
| February 18, 1948..... | 0.7 | 0.9 | 6.7 | 0.2 | 91.5 | 0.74 | 3.0 | 2.6 | 41.7 | 44.2 | 8.5 |
| February 20, 1948..... | 0.6 | 0.8 | 6.3 | 0.2 | 92.1 | 0.67 | 0 | 1.2 | 34.0 | 47.9 | 16.9 |
| Average ..... | 0.6 | 0.6 | 8.9 | 0.3 | 89.6 | 0.72 | 1.5 | 2.8 | 38.2 | 47.1 | 10.4 |
| (c) *After Screening—Rechipper not Operating* | | | | | | | | | | | |
| February 17, 1948..... | 0.9 | 1.8 | 9.7 | 0.4 | 87.2 | 0.74 | 6.8 | 2.0 | 38.6 | 45.9 | 6.7 |
| February 21, 1948..... | 0.9 | 0.4 | 8.6 | 0.3 | 89.8 | 0.69 | 1.1 | 1.1 | 35.4 | 48.6 | 13.9 |
| Average ..... | 0.9 | 1.1 | 9.1 | 0.4 | 88.5 | 0.72 | 3.9 | 1.6 | 37.0 | 47.2 | 10.3 |

**TABLE III "Sawdust" removed by Rotex Chip Screens**

| Date | Knives | % of wood chipped screened out as sawdust & matchsticks | % of screened out fraction which was matchsticks | % of wood chipped screened out which was matchsticks | % of wood chipped screened out as oversize | Comments |
|---|---|---|---|---|---|---|
| (a) Rechipper Not Operating | | | | | | |
| February 11, 1948 | Average | 3.3 | ... | .. | .. | 100% Hemlock |
| February 12, 1948 | Dull | 4.1 | 39.8 | 1.6 | 1.0(1) | |
| February 16, 1948 | Sharp | 2.6 | 37.8 | 1.0 | 1.0 | |
| Average | | 3.3 | 38.8 | 1.3 | 1.0 | |
| (b) Rechipper Operating | | | | | | |
| February 10, 1948 | Average | 3.3 | ... | ... | 83% Hemlock, 17% Balsam | |
| February 10, 1948 | Average | 3.3 | 42.8 | 1.4 | 93% Hemlock, 7% Balsam | |
| February 13, 1948 | Sharp | 2.4 | 54.6 | 1.3 | ..... | |
| February 20, 1948 | Dull | 3.7 | 43.3 | 1.6 | ..... | |
| Average | | 3.2 | 46.9 | 1.4 | | |

*Notes:* (1) 32.4% of the oversize fraction was found to be acceptable chips.
(2) *Matchstick*—Samples of the "sawdust" fraction were handsorted and any piece longer than ½" was called a matchstick.

knives was unaffected by the addition of water, and also that water had no measurable effect in maintaining the sharpness of the knives, at least over the speed range in use. Table V and Chart III contain the relevant data.

### Performance of the Rotex Screens

Table III summarizes the performance of the Rotex screens. It was found that the screens remove 80 percent of the sawdust in the feed, thus leaving 0.4 percent of log weight in the accepted fraction from the screens as sawdust. In addition to sawdust, the screens also remove 1.8 percent of log weight in the form of matchsticks, thus removing a total of 3.2 percent of log weight, as undersize fraction. From the viewpoint of removal of sawdust, the screens are considered satisfactory. As oversize fraction, the screens reject one percent of original feed, of which some 30 percent is chips of acceptable size. This one percent is returned to screen feed through the rechipper.

### Performance of the Rechipper

From Tables I. II and III, the performance of the rechipper may be deduced. Its operation does not appear to have any adverse effect on chip size distribution. It has eliminated the rejection of some originally suitable chips and reduced other material sufficiently to permit acceptance by the screens. However this is done only by including about 0.5 percent of log weight in the form of undesirable knotwood and associated bark.

### Quality of Chips to Digesters

Tables I and II show the average quality of chips to the digesters. Apart from what is considered a somewhat high percentage of fines, the average quality of chips to the digester is satisfactory.

*Conclusion.*

The combination of hydraulic barking and whole log

**TABLE IV Average Chip Test Results**

Average Quality—Unscreened Chips Before Surge Bins
(Sampled every 5 minutes for six-eight hour periods.)

| | Coarse Stuff | | Fine Stuff | | Chips | | % Chip-Length Distribution | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Slivers | % Blocks | % Fines | % Sawdust | % | Avg. Length inches | —1¼" | 1"-1¼" | ¾"-1" | ½"-¾" | ¼"-½" |
| | 1.6 | 0.7 | 6.1 | 0.7 | 90.9 | .75 | 0.4 | 2.9 | 50.5 | 38.9 | 7.3 |
| | | | | | (see Chart I) | | | | | | |
| Chip Quality Obtained From Different Log Sections. | | | | | | | | | | | |
| (a) *Using Sharp Knives (in use 1.7 Hours)* | | | | | | | | | | | |
| Tip ..... 5% | 0.3 | 0.1 | 5.2 | 0.8 | 93.6 | .75 | 0.1 | 0.9 | 54.4 | 4.2 | 3.4 |
| Tip Centre .....35% | 0.3 | 0 | 4.3 | 0.5 | 94.9 | | 0 | 0.1 | 58.8 | 39.9 | 1.2 |
| Butt Centre .....35% | 0.6 | 0 | 5.6 | 0.5 | 93.3 | .75 | 0.6 | 3.1 | 46.1 | 46.8 | 3.4 |
| Butt .....25% | 3.6 | 5.0 | 6.9 | 0.7 | 83.8 | .76 | 6.3 | 4.0 | 44.4 | 31.2 | 14.1 |
| (b) *Using Dull Knives (in use 8.5 Hours)* | | | | | | | | | | | |
| Tip ..... 5% | 0.6 | 0.2 | 6.9 | 1.2 | 91.1 | .76 | 0.1 | 0.9 | 63.1 | 32.5 | 3.4 |
| Tip Centre .....35% | 0.5 | 0.1 | 6.0 | 0.8 | 92.6 | .78 | 0.1 | 2.1 | 67.3 | 26.3 | 4.0 |
| Butt Centre .....35% | 0.5 | 0.2 | 6.0 | 0.6 | 92.7 | .75 | 0.3 | 1.3 | 56.4 | 36.0 | 6.0 |
| Butt .....25% | 3.9 | 3.9 | 9.4 | 1.6 | 81.2 | .69 | 0.9 | 4.2 | 39.6 | 33.9 | 21.4 |
| | | | | | (see Chart II) | | | | | | |
| Chip Quality—Two Logs Chipped Tip to Butt (Knives Fairly Dull, in use 8 hours) | | | | | | | | | | | |
| Tip .....1st Log | 0.8 | 0.9 | 5.9 | 0.5 | 90.9 | .68 | 0 | 1.6 | 32.1 | 55.2 | 11.1 |
| ½ ..... 1st Log | 0.4 | 0 | 6.7 | 1.3 | 91.6 | .73 | 0 | 0.5 | 48.7 | 45.7 | 5.1 |
| ¾ .....1st Log | 0.5 | 0 | 11.5 | 1.6 | 86.4 | .68 | 0 | 1.1 | 36.9 | 46.7 | 15.3 |
| Butt .....1st Log | 0.4 | 0.2 | 11.8 | 1.2 | 86.4 | .65 | 0 | 0.6 | 26.2 | 54.4 | 18.8 |
| Tip .....2nd Log | 0.4 | 0.1 | 7.0 | 1.1 | 91.4 | .74 | 0 | 0.2 | 45.2 | 53.5 | 1.1 |
| ½ .....2nd Log | 0.2 | 0.3 | 5.8 | 0.8 | 92.9 | .72 | 0.6 | 0.8 | 34.2 | 62.4 | 2.0 |
| ¾ .....2nd Log | 0.5 | 0 | 8.8 | 1.2 | 89.5 | .69 | 0 | 0.2 | 44.5 | 40.1 | 15.2 |
| Butt .....2nd Log | 0.7 | 0 | 10.9 | 1.4 | 87.0 | .69 | 0.2 | 1.7 | 35.0 | 52.3 | 10.8 |

chipping has resulted in a wood saving of 14 to 15 percent over former equipment. The saving directly attributable to chipping whole logs is the 6 to 8 percent of log weight formerly lost in sawkerf when cutting 32-inch blocks. A wood saving of 15 percent means that for every 100 tons of sulphite pulp produced enough wood has been saved to make an additional 14 tons. Wood handling and prepaartion labour costs per ton of sulphite pulp produced, were halved with the abandonment of the old system of preparing and chipping 32-inch blocks. The chipper has required very little mechanical maintenance to date and the few items that have developed are not expected to be difficult to solve. The Rotex screens and rechipper have operated satisfactorily.

Thus, from the viewpoints of operation and chip quality, the whole log chipper and associated equipment are quite satisfactory and as a means of more economic use of wood, an unqualified success.

**Bibliography**


(1) Stewart A.R.M. "The Powell River Hydraulic Barkers And New Wood Preparing Plant". Pulp and Paper Magazine of Canada, Vol. 47, 95-102, (Nov. 1946)

(2) Baker P. R. and Lory M. R. "The Application of Synchronous And Induction Motors to Chippers". A.I.E.E. Technical Paper, 47-130, April 1947.

(3) Wardwell N. P. "A New Theory of Chipper Design". Paper Ind. 21, No. 12, 1264-1265, March 1940.

(4) Yorston F. H. "Studies in Sulphite Pulping." Department of Mines & Resources Bulletin 97, p. 71, Ottawa, 1942.


## POWELL RIVER STANDARD TEST METHOD

### CHIP QUALITY AND LENGTH DETERMINATION (Modification of TAPPI Method)

*Apparatus.*

(10 Screens—One screen of 3 meshes per inch and one screen of 6 meshes per inch, as shown in attached sketch.

(2) Balance—Sensitivity of not less than 0.1 percent of load.

(3) Oven —Suitable oven capable of being controlled to 212± 5°F.

*Sample.*

A 24-hour composite sample of not less than 11 kilograms, drawn by taking a grab sample from the chip stream to each digester, each cook. The sample to be kept in a container provided with a tight fitting lid.

*Done Dry Wood Content.*

A representative portion, weighing approximately 1 kilogram, taken from the composite sample, is to be dried at 212± 5°F for 24 hours. Dry weight divided by wet weight of this sample, is to be reported as percent bone dry wood in the chips.

*Chip Quality.*

A 10 kilogram portion of the composite sample is to be spread out evenly and thinly on a smooth top bench for hand sorting. Black knots, pin knots, knot wood, bark, rot, blocks, and slivers, are to be picked out and any normal wood adhering to bark is to be removed from the bark with a sharp knife and returned to the chips. Each of these various categories is to be weighed up to the nearest tenth (0.1) of a gram.

**TABLE V**

| Date | Chipping Condition | Ton (Wet) Chips Produced by Knives in use, Since Sharpening, at Time of Test | % Log Weight Rejected by Chip Screens (Rate at time of Test) |
|---|---|---|---|
| 1948 | | | |
| February 10 ..... | Dry | 50 | 3.30 |
| February 11 ..... | Dry | 150 | 3.33 |
| February 12 ..... | Dry | 265 | 3.94 |
| February 17 ..... | Dry | 30 | 2.59 |
| February 20 ..... | Dry | 250 | 3.76 |
| March 9 ..... | Wet | 4.5 | 2.34 |
| | Wet | 20.4 | 2.42 |
| | Wet | 32.0 | 2.43 |
| | Wet | 49.9 | 2.45 |
| | Wet | 67.8 | 2.54 |
| | Wet | 35.3 | 2.70 |
| April 1 ..... | Wet | 9.6 | 1.92 |
| | Wet | 76.8 | 2.14 |
| | Wet | 160.8 | 3.00 |
| | Wet | 215.3 | 4.70 |
| | Wet | 267.0 | 2.92 |
| April 1 ..... | Dry | 32.3 | 2.38 |
| | Dry | 183.1 | 2.82 |
| | Dry | 257.1 | 2.52 |
| April 8 ..... | Wet | 221.0 | 2.48 |

Note: All above data taken while chipping average quality and size, 75%-25%, mixture of hemlock and balsam logs.

The remainder of this 10 kilogram portion is to be screened through a screen having 3 meshes per inch. The portion passing the 3-mesh per inch screen is to be rescreened through a screen having 6 meshes per inch. The portion retained on the 3-mesh screen is to be designated chips, that retained on the 6-mesh screen is to be designated fines, and that pasing the 6-mesh screen is to be designated sawdust.

For the determination of average chip length, approximately 250 grams of chips are to be drawn by slipping a 6-inch square thin metal plate, corner first, completely under a conical pile made from the thoroughly mixed chips, and then lifting the plate vertically clear of the pile. Care must be exercised in obtaining a representative sample. Each chip in the portion retained on the metal plate is to be measured to the nearest ⅛ inch. The measurement is to be made along the chip from one cut face to the other cut face. The measured chips are to be segregated into groups of:

Up to, but not including ⅜" in length.
⅜" and up to, but not including ½" in length.
½" " " ⅝" "
⅝" " " ¾" "
¾" " " ⅞" "
⅞" " " 1" "
1" " " 1⅛" "
1⅛" " " 1¼" "
1¼" and over.

Each group is to be weighed to the nearest (0.1) tenth of a gram.

*Calculations.*

(a) *Dirt.*

For calculating the equivalent dirt caused by black

knots, pin knots and bark, factors as shown below are to be used. These factors were taken from some unpublished work of the Weyerhaeuser Timber Company, and represent the relative dirt producing potential of these materials in finished sheet sulphite pulp.

| | | |
|---|---|---|
| Grams weight of black knots x 13 | = | Black knots equivalent dirt. |
| Grams weight of pin knots x 4 | = | Pin knots equivalent dirt. |
| Grams weight of bark x 48 | = | Bark equivalent dirt. |

(b) *Average Chip Length.*

Average chip length is to be calculated from the weighted average of the several length groups. That is, the sum of the products of the weight of a group times the mid-length of that group, divided by the total weight of the groups is the average chip length.

*Reporting.*

The data obtained by this test procedure are to be reported on the form "Report of Sulphite Chip Quality and Length," (form S.P.U. 27) and values, with the exception of chip length, are to be reported to the nearest tenth.

The data for the several groups of chip lengths are to be added in such a way that values are reported for groups as follows:

Up to, but not including ½" in length.
½" and up to, but not including ¾" in length.
¾" " " 1" "
1" " " 1¼" "
1¼" and over.

Average chip length is to be reported to the nearest hundredth.

# Arbitration Clauses in the Paper Industry

A study of the 100 labor contracts which were utilized in this year's analysis of union agreements reveals that 86 of them contain clauses dealing with arbitration, the American Paper and Pulp Ass'n. stated in a copyrighted article in its *Monthly Statistical Summary* issued last week. Only 14 of the 100 contracts remain completely silent on the subject, the article continues.

"A study of the contracts shows that resort may be had to Single Man Board, to Tri-partite Boards or to Five Man Boards of Arbitration. Since there is such a diversity of composition of arbitration boards, no single pattern emerges as typical of the industry. Within each of the three types, however, a considerable degree of uniformity may be observed.

"A problem common to all of the 86 contracts which refer to arbitration is that of selection of the neutral member, whether the boards be composed of one, three or five men. It is with this problem that this article is primarily concerned.

### Single Man Board

"In 19 out of 100 contracts, provision is made for appointment of a single arbitrator to whom unsettled disputes are referred for final disposition. It is seen, however, that the manner of his selection is widely varied. The most common method adopted, which is utilized in six of these 19 contracts, calls for the arbitrator to be chosen by the American Arbitration Association.

"Equally popular methods of appointing the single arbitrator are the selection by mutual agreement and the selection by one of the State Boards of Mediation and Conciliation. Of the 19 contracts, five provide for the selection of the umpire by mutual agreement of the parties; five other contracts provide for his selection by one of the State agencies. One contract provides for the arbitrator to be appointed by the Director of the United States Conciliation Service (now the Federal Mediation and Conciliation Service).

"It is interesting to note that in the five contracts wherein the arbitrator is selected by mutual agreement, no provision for appointment is made in the event the parties are unable to agree upon his selection. Two other contracts, however, explicitly meet this contingency. One provides for the appointment of the arbitrator by the American Arbitration Association and the other provides for appointment by a State agency in case the parties cannot agree on an arbitrator.

### Tri-Partite Arbitration Board

"The most commonly stipulated board of arbitration in these contracts is a three-man board. This is borne out by the statistics showing that 61 contracts contain provisions for such a tri-partite board. All of these 61 contracts call for one member selected by the company, one member selected by the union, and the third to be chosen by the other two. As demonstrated by the statistics below, the only variation in these clauses is in the provision for the selection of the third member in the event the other two are unable to agree upon him.

"Twenty of the 61 contracts provide, in almost identical terms, for the selection of this third member by the Secretary of Labor. Thirty-three contracts provide for the appointment of the third member by a person other than the Secretary of Labor. Here again there is a wide variation in the designation of a person or agency who is to select the third member upon failure of the parties themselves to do so.

"Ten of the 33 contracts provide for selection by the American Arbitration Association: six call upon a State agency; and six call upon a Supreme Court Justice of the State, when the parties themselves fail to choose the third arbitrator.

"Four of these 33 contracts refer the problem to selection of the third arbitrator to the Federal Mediation and Conciliation Service. Three contracts refer it to the State Deputy Commissioner of Labor; two contracts call upon the Governor of the State; one stipulates that a named individual shall make the selection; and, lastly, one contract calls upon a United States District Judge.

"Of the 61 contracts calling for a three-man board, eight lack any provision in the event that the company and the union representatives are unable to agree upon the third arbitrator. In the other 53 contracts where provision is made for such a contingency, nine different methods are employed to meet it.

### Five-Man Arbitration Board

"Only six of the 100 contracts studied provide for an arbitration board consisting of five members. The composition of this type of board is substantially the same as that for the three-man board. Thus generally, the company selects two persons, the union selects two persons, and the four thus chosen select the fifth party. Where the four members fail to agree upon the fifth, two contracts provide for the Secretary of Labor to appoint him and one provides for his appointment by a United States District Judge. In one contract the fifth member is stipulated; while two other contracts make no reference to his appointment in the event the other four fail to agree upon him.

"As attested to by the statistics above, the type of board most frequently referred to in the contracts is the three man board. Considerably fewer contracts stipulate a single arbitrator; and only a negligible number of contracts provide for a five man board. While, as a factual matter, but few cases for arbitration may arise yearly in the industry, it is none the less true that a preponderant number of contracts do set up the machinery in the event that it might be needed.

### Cost of Living

"The cost of living index, based on January 1941 as 100, was 173.1 for September 1948, unchanged between September and August 1948 and 5.6 points over January 1948."

# Trends

Office of the PAPER TRADE JOURNAL, Wednesday, November 24, 1948.

### Economic Indicators*

Summarized November report of the nation's economic trends states that "Preliminary 3rd quarter estimates of the *Nation's Economic Budget* indicate that the total increased about 3 percent above the level for first half of this year, chiefly as a result of price rises. The government surplus was greatly reduced as Federal receipts from personal income taxes declined. . . . In September, *consumers' prices,* for the first time since April, did not advance. Declines in foods offset rises in other consumers' prices. . . . *Wholesale prices* fell sharply in early October as a result of reductions in prices of farm products and foods. Since then they have shown a slightly rising tendency. Industrial prices have been steady. . . . Index of prices received by farmers dropped substantially from September to October, as harvesting of the bumper corn crop began. Meat animal prices fell more than seasonally and return for butterfat declined. . . . *Industrial stock prices rallied* during October; railroads registered small gains; utilities changed little. . . .

### Employment

*Civilian employment* in October remained above 60 million despite a slight seasonal decline. Unemployment fell to 1.6 million, the lowest level since last Fall. An increase in manufacturing and government *employment* lifted total nonagricultural wage and salary workers about 250,000 above the previous all-time peak of last December. . . . *Average weekly hours* of work in August were unchanged from July, except in coal mining where there was a return to normal after the July strikes in "captive" mines. Preliminary data for September show a slight decline in manufacturing. . . . Despite a decrease in the number of new strikes in September, man-days of idleness increased. The extended maritime and oil strikes on the west coast and the auto-suppliers' strike in Detroit were largely responsible. . . . *Industrial production* in September continued at the August level. Manufacturing output was up a little, while mining was down 3 percent. Preliminary data indicate October production was back to the postwar-peak levels reached in February of this year. . . . Steel production reached a postwar peak in September. Production of transportation equipment was curtailed by the auto-suppliers' strike. Output of lumber declined somewhat. . . . Textile production rose further in September from the low summer levels. Food production recovered most of the August drop. Petroleum output was reduced by the west coast strike. . . .

* Source: Congressional Joint Committee on the Economic Report.

### Construction Activity

The volume of *construction activity* declined somewhat in October due principally to drops in the nonresidential field. . . . The number of *housing starts* declined again in September. For the second successive month, the figure was below that of the previous year. . . . *Nonagricultural business expenditures* on plant and equipment this year will probably be 15 percent more than in 1947. Business plans for 4th quarter show a decline of about $1 billion (annual rate) from 3rd quarter, with most of the decrease in expenditures for manufacturing construction. . . . Total *exports* and the export surplus decreased further in September. The value of imports fell back to the July level. . . . New issues in 3rd quarter of 1948 were below those of the previous quarter but at the same rate as a year ago. Three-fifths of the proceeds were earmarked for plant and equipment. . . . *Manufacturing sales* continued to rise in September; retail sales, seasonally adjusted, have shown little change since spring. . . .

### National Income

*National income* continued to move up in the 3rd quarter of 1948. All components were significantly above the 3rd quarter of last year. . . . *Corporate profits* so far this year are running above the 1947 levels. . . . *Personal income* in September remained at the August level of $214.6 billion (annual rate). . . . The 3rd quarter increase in *consumer income* and expenditures was attributable to high-level employment, wage increases and tax reductions. The rate of saving continued up. . . . Real purchasing power per capita for the 3rd quarter changed little from the average for the first half of 1948. . . . *Average hourly earnings* continued to rise in August as further wage settlements were reached. Preliminary data for September indicate a further rise in manufacturing earnings. . . . Increases in *average weekly earnings* were general in August. Preliminary September data show manufacturing earnings off slightly due to a decrease in hours worked. . . . *Farm income* increased seasonally in September. Prices paid were down a little, reflecting a decrease in feed prices. . . .

### Durable Purchases

*Durable purchases* rose nearly 8 percent in the 3rd quarter as increased output made more goods available. Expenditures for nondurables and services also were up somewhat. . . . *Consumer credit* increased again from the end of August to the end of September. It was too soon after the reimposition in instalment credit controls on September 20 to determine their effect on consumer credit. . . . Commercial bank loans increased $1 billion from the end of August to the end of September. Government security holdings dropped more than $2 billion. . . . Most of the $600 million increased in September *money supply* resulted from an increase in Government deposits. . . . The $1.3 billion excess of Federal cash receipts over cash payments for the 3rd quarter of the calendar year 1948 was just above the 2nd quarter excess.

### Wholesale Price Index

Measured by the Bureau of Labor Statistics Wholesale Price Index, prices are declining steadily. From a high of 169.5 percent of its 1926 average in August, this index has steadily declined to 162.7 for the week ended November 6. Price easing reported in cotton textiles, lumber, rubber, some chemicals and minor paper categories reflect heavy supply and eased demand. This slackened demand, considered as the key to future price declines, is thought by some economists to be insufficient evidence of an established trend. Rather it is viewed as a temporary slack from which a rally can be expected, not perhaps before a strong effect may be felt on the price level.

### Wood Pulp

Generally the local market is dull. A few small "panic" sales are reported as the result of the dock strike. By and large, mills have adequate inventories and show no interest in acquiring additional supplies. Supply and demand for chemical pulp are reported in balance. Some tightening of supply of domestic ground wood is reported, the result of the Canadian and New England drought.

Unsold parcels of Swedish wood pulp seem to find buyers at current quotations, reports a leading Swedish journal. "Even though the situation in the U.S.A. and Bizonia is thus not very satisfactory, the statistical position is by the pulp industry considered to be fairly good. Increased interest in buying is noticeable in several other markets, e.g., in South American and on the continent of Europe. . . . The demand from Bizonia for further price reductions bears no reasonable relation to the costs of the Scandinavian producers. Most manufacturers in the northern countries are therefore likely to hold back for some time rather than accept business on the conditions now offered from there."

### Paperboard

Current demand for paperboard products as a whole is at a steady high level. Folding boxboard is reportedly in strong demand as pre-packaging of vegetables and meats, and continued growth of frozen food industries, etc., develop new end uses. Setup boxboard is in good demand. Prices look firm. Production continued at high peak for the week ended November 13, although

*(Continued on page 38)*

# Imports

Week Ending Nov. 20

## NEW YORK

### Newsprint

H. G. Craig Co., G.D.D., Donnacona, 358 rolls.
News Syndicate Co., Ethel Tombs, Gatineau, 222 rolls.
R. A. Olsen, A.C.D., Donnacona, 385 rolls.
News Syndicate Co., Richard J. Barnes, Thorold, 1125 tons.
R. A. Olsen, G.T.D., Donnacona, 366 rolls.
N. Y. World Telegram, Tudor Prince, Cornerbrook, 1532 rolls.
Clinton Paper Corp., Tudor, Cornerbrook, 796 rolls.
Bato Co., Inc., Tudor Prince, Cornerbrook, 564 rolls.
R. A. Olsen, Donpaco, Donnacona, 371 rolls.

### Paperhangings

W. H. S. Lloyd & Co., American Banker, London, 6 cs., 18 bls.
C. A. Haynes & Co., American Banker, London, 4 bls.

### Filter Paper

H. Reeve Angel & Co., Inc., American Banker, London, 23 cs.
Canadian National Railways, Stockholm, Gothenburg, 1 cs.

### Drawing Paper

H. Reeve Angel & Co., Inc., American Banker, London, 4 cs.

### Surface Coated Paper

Gevaert Co. of America, Stavelot, Antwerp, 7 cs.

### Wallpaper

Intramar Shipping Co., American Shipper, Havre, 1 cs.

### Parchment Paper

H. Reeve Angel & Co., Inc., Jefferson City Victory, Antwerp, 4 cs.

### Wrapping Paper

Sandvik Steels, Inc., Stockholm, Gothenburg, 2 cs.

### Tissue Paper

North American Continental Co., Pioneer Lake, Kobe, 60 cs.

### Rice Paper

W. Tyle Co., Pioneer Lake, Honk Kong, 10 cs.

### Paperboard

Bulkley Dunton Co., Kathryn, San Juan, 234 rolls.

### Miscellaneous Paper

International Printing Ink Corp., Frances, Antwerp, 1 cs.
Kersten Shipping Agency, Saturnia, Genoa, 1 cs.
Manhattan Storage Co., Stockholm, Gothenburg, 3 cs.

### Rags, Baggings, Etc.

E. J. Keller Co., Inc., Frances, Antwerp, 79 bls. rags, 73 bls. old bagging.
Castle & Overton, Inc., Frances, Antwerp, 78 bls. jutewaste.
A. de Vries Corp., Frances, Antwerp, 105 bls. old rags.
(———), Frances, Antwerp, 58 bls. old bagging.
E. J. Keller Co., Inc., Goya, Havre, 61 bls. jute waste.
New England Waste Co., Louis McHenry Howe, Cochin, 592 bls. cotton waste.
W. Intner, Louis McHenry Howe, 300 bls. cotton waste.
C. Comiter, Louis McHenry Howe, 100 bls. cotton waste.
Railway Supply & Manufacturing Co., Louis McHenry Howe, Cochin, 25 bls. cotton waste.
Volkart Bros., Louis McHenry Howe, Cochin, 100 bls. cotton waste.
E. J. Keller Co., Inc., Louis McHenry Howe, Genoa, 100 bls. old jute rags.
(———), Louis McHenry Howe, Genoa, 199 bls. old jute rags.
New England Waste Co., Louis McHenry Howe, Genoa, 100 bls. old hessian rags.
National City Bank, Louis McHenry Howe, Genoa, 139 bls. jute waste.
A. de Vries Corp., Louis McHenry Howe, Genoa, 163 bls. scrap bagging.
H. Adlerstein, Louis McHenry Howe, 47 bls. old jute rags.
(———), Coer d'Alene Victory, Venice, 134 bls. bagging.
C. Comiter, Exchester, Genoa, 83 bls. cotton waste.
Chase National Bank, American Manufacturer, Manchester, 5 bls. rags.
J. P. Fleisig, Agnete, Santos, 235 bls. jute waste.
C. Kutz, Tonghao, Shanghai, 200 bls. cotton waste.
Harris Goldman Co., Tonghao, Shanghai, 56 bls. bagging.
Royal Manufacturing Co., Arkrundyk, Antwerp, 43 bls. cotton waste.

### Casein

(———),Rio Tercero, Buenos Aires, 1000 bags.
(———), Brazil, Buenos Aires, 1900 bags.
American Cyanamid Co., Brazil, Buenos Aires, 1182 bags.
F. H. Paul & Stein Bros., Brazil, Buenos Aires, 260 bags (lactic).

### Gluestock

H. Remis, Agwiprincess, Vera Cruz, 582 bdls.
(———), Agwiprincess, Havana, 44 bdls.
H. Remis, Seatrain Havana, Havana, 149 bls.

## BOSTON

W. Filene & Sons, American Shipper, Havre, 1 cs. writing paper.
American Express Co., American Shipper, Havre, 1 cs. writing paper.
The Borden Co. Chemical Division, Agnete, Buenos Aires, 500 bags ground lactic casein.

## PHILADELPHIA

Chemical National Bank Trust Co., Coer d'Alene Victory, Venice, 78 bls. old cottons.

## NORFOLK

Durham Herald Co., Blommersdyk, Rotterdam, 86 rolls newsprint.

## Masonite Ukiah Plant

CHICAGO—The Masonite Corp. has awarded the contract for construction of its hardboard manufacturing plant at Ukiah, Calif., to Barrett & Hilp, of San Francisco. Estimated maximum cost of the work is in excess of $900,000.

The factory building, expected to be completed by next June, will house the manufacturing unit, tempering plant and warehouse. Its overall length will be 1,000 feet, with the width varying from approximately 100 feet to 300 feet. It will have concrete floors, steel frame and corrugated metal siding. The roof will be of pre-cast concrete slab. The engineering was handled by Masonite's engineering department under the direction of Frank G. Lesniak, chief engineer.

A one-story office building of frame construction, 92 by 40 feet, is being erected under a separate contract, which went to Frank M. Crane, of Ukiah.

Awarding of these contracts is the second major construction step in the execution of the west coast expansion program announced by Masonite last March. The project included purhcase of a factory site of 114 acres for a logging road from the plant site into the company's timber reserve.

Construction work on the road was started in July. This contract is held by Utah Construction Co., also of San Francisco.

## GOVERNMENT BIDS

### PROPOSALS

FOR FURNISHING

PAPER AND ENVELOPES FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a.m., December 6, 1948, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper and plain envelopes for the use of the Government departments and establishments in the District of Columbia, for the terms of 3 months for paper and 6 months for envelopes beginning January 1, 1949, deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposals. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications may be obtained by addressing John J. Deviny, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the proposal for paper and paragraph 13 of the proposal for envelopes.

The approximate estimated quantities set forth in detail in the schedules comprise:

PAPER

850,000 pounds newsprint paper; 1,040,000 pounds machine-finish book paper; 700,000 pounds offset book paper; 160,000 pounds offset poster paper; 120,000 pounds antique book paper; 20,000 pounds 50% laid antique book paper; 40,000 pounds water-resistant text book; 350,000 pounds supercalendered book paper; 500,000 pounds coated book paper; 2,150,000 pounds mimeograph paper; 150,000 pounds duplicator copy paper; 250,000 pounds U S M O safety writing paper; 2,130,000 pounds writing paper; 500,000 pounds map paper; 140,000 pounds manifold paper; 850,000 pounds bond paper; 270,000 pounds ledger paper; 505,000 pounds index paper; 90,000 pounds cover paper; 110,000 pounds manila paper; 20,000 pounds kraft paper; 50,000 sheets gummed paper; 15,000 pounds tag board; 15,000 sheets litho-coated cardboard; 10,000 sheets railroad board; 80,000 pounds wood cardboard; 60,000 pounds tan board; 4,750,000 pounds postal card paper; 20,000 sheets pressboard; 200,000 pounds newsboard; 15,000 pounds binder's board; 105,000 pounds chestnut cover board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

ENVELOPES

The approximate estimated quantities set forth in detail in the schedule comprise:

18,075,000 Kraft; 4,520,000 Writing, Chemical Wood, white and colored; 50,000 100% Writing, White; 680,000 25% Bond, White; 250,000 100% Bond, White.

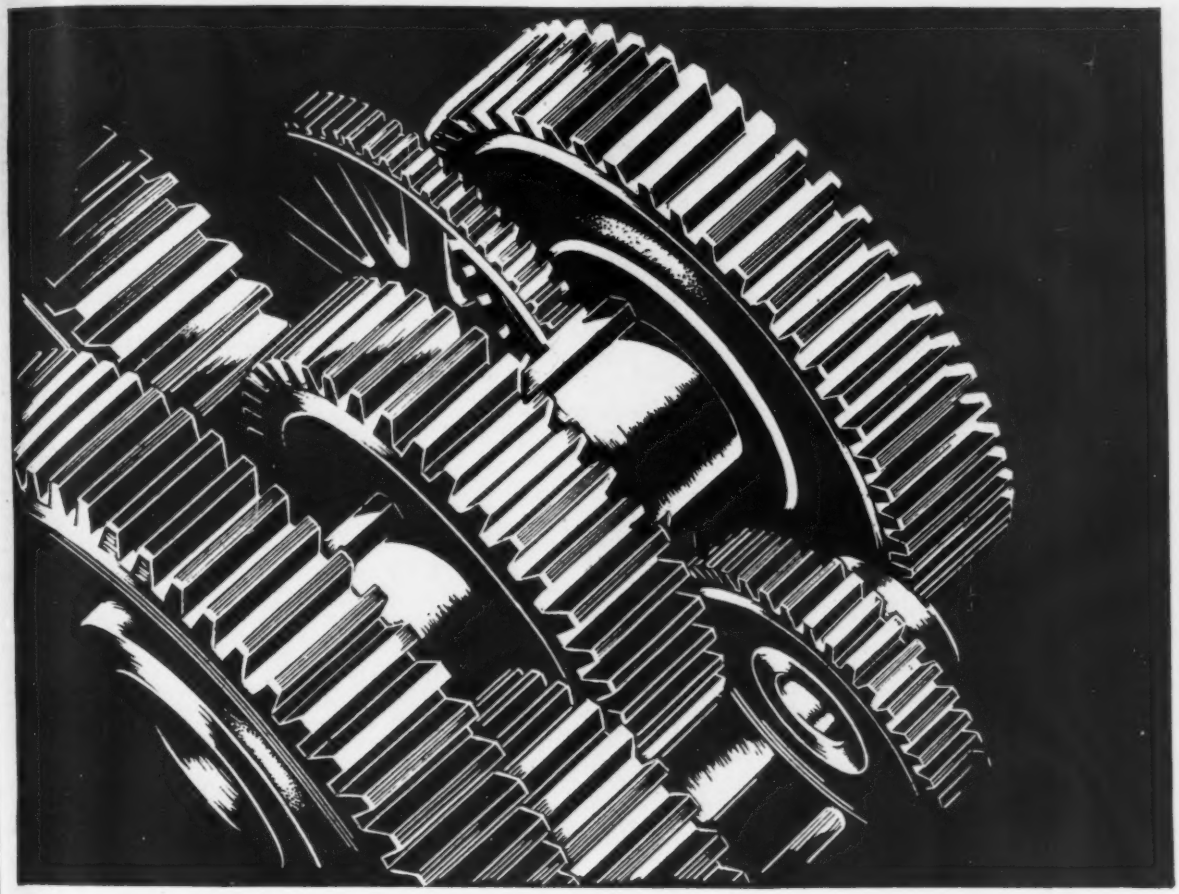
By direction of the Joint Committee on Printing.

JOHN J. DEVINY,
*Public Printer.*

WASHINGTON, D. C.,
*November 15, 1948.*

D-2

# YES! Tycol "Engineered Lubrication" performs better . . . BETTER . . . BETTER



**Tycol Engineered Lubrication performs better because:**

. . . *Tycol Engineered Lubrication* supplies the scientific answer to every lubricating need in industry—from spindle oils for textile plants to roll neck greases for steel mills.

. . . *Tycol Engineered Lubrication* boosts production by promoting efficient, smoother-running machine operation . . . there's a Tycol oil or grease "engineered" for your specific job.

. . . *Tycol Engineered Lubrication* slashes costs by prolonging equipment life, protecting it against wear and tear . . . repair bills and "down time" are invariably reduced.

Let Tide Water Associated help you select the best lubricant for your particular need. Write, wire or phone today to your nearest Tide Water Associated Office for full details.

TYCOL
INDUSTRIAL LUBRICANTS

**Boston • Charlotte, N. C.**
**Pittsburgh • Philadelphia**
**Chicago • Detroit • Tulsa**
**Cleveland • San Francisco**

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE · NEW YORK 4, N. Y.

**LUBRICATION — "ENGINEERED TO FIT THE JOB"**

# Prices

**Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.**

## NEW YORK

### Paper

(Delivered New York)

Standard News, per ton—

| | |
|---|---|
| Rolls, contract | $100.00/ — |
| Sheets | 115.00/ — |

Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.

| | |
|---|---|
| Superstandard Wrapping | $9.00/ — |
| No. 1 Wrapping | 7.75/ 8.00 |
| Standard Wrapping Rolls | 7.00/ — |
| Standard Wrapping Sheets | 7.50/ — |
| Standard Bag | 6.50/ — |

Tissues—Per Ream 24x36 (480) 10/11 lbs. Zone 1.

| | |
|---|---|
| Wh. No. 1 Frd. | $1.84/$2.00 |
| Wh. No. 1 M. G. | 1.94/ 2.00 |
| Wh. No. 1½ | 1.65/ — |
| Wh. No. 2 | 1.50/ 1.70 |
| Kratt Anti-Tar | 1.65/ — |
| Kraft Unbl. | 1.85/ — |
| Shred. Wh. No. 1 per lb. | .12¾/ .18 |

Toilet—Per Case of 100 rolls—1 M Sheets.

| | |
|---|---|
| Unbleached | $7.50/$10.00 |
| Bleached | 8.75/ 10.00 |

Paper Towels—Per Case of 3750—Zone 1.

| | |
|---|---|
| Wh. Jr. M'tif'd 9¼x9½ | $5.45 |
| Br. Sr. M'tif'd 10x12 | 3.80 |
| Br. Jr. M'tif'd 9½x9¾ | 3.30 |
| Br. Jr. Sgl. fold 10x10¾ | 3.35 |

Manila—per cwt.—C-1 f.a.

| | |
|---|---|
| No. 1 Jute Tag | $14.50/ — |
| Reg. Jute Manila | 13.25/$15.50 |
| No. 1 Manila Wrapping | 8.75/ 10.50 |
| 5 lb. Manila | 10.75/ 11.25 |

Boards, per ton—

| | |
|---|---|
| Filled News | 94.00/ |
| Plain Chip | 85.00/ 90.00 |
| Blchd. Mla. L-d. Chip* | 105.00/ |
| White Pat. coated* | 120.00/ |
| Kraft Liners 42 lb. | 105.00/ |
| Kraft Corr. .009 | 110.00/ |
| Binders Boards | 120.00/126.00 |

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—

White, 16 lb.

Bonds, per cwt.

| | Carton | 4 C't'n | Ton |
|---|---|---|---|
| 100% Rag Ext. No. 1 | $59.00 | $54.55 | $52.30 |
| 100% Rag | 52.25 | 48.30 | 46.30 |
| 75% Rag | 41.50 | 38.30 | 36.70 |
| 50% Rag | 33.75 | 30.70 | 29.50 |
| 25% Rag | 30.25 | 27.45 | 26.35 |

Ledgers, per cwt.

| | | | |
|---|---|---|---|
| 100% Rag Ext. No. 1 | $57.00 | $52.65 | $50.50 |
| 100% Rag | 50.25 | 46.40 | 44.50 |
| 75% Rag | 41.50 | 38.30 | 36.70 |
| 50% Rag | 33.75 | 30.70 | 29.50 |
| 25% Rag | 30.25 | 27.45 | 26.35 |

Sulphite Bonds and Ledgers—White, 16 lbs.

Bonds, per cwt.

| | | | |
|---|---|---|---|
| No. 1 | $21.25 | $19.25 | $18.50 |
| No. 2 | 20.25 | 18.30 | 17.55 |
| No. 4 | 19.25 | 17.55 | 16.85 |

Ledgers, per cwt.

| | | | |
|---|---|---|---|
| No. 1 | $21.75 | $19.65 | $18.85 |
| No. 2 | 20.75 | 18.75 | 18.05 |
| No. 4 | 20.00 | 18.10 | 17.35 |

White Book, per cwt.—Coated

| | Case | Ton |
|---|---|---|
| No. 1 Glossy | $20.90 | $20.15 |
| No. 2 Glossy | 19.65 | 18.90 |
| No. 3 Glossy | 18.90 | 18.25 |
| Machine Coated | 16.65 to 17.15 | 16.05 to 16.35 |
| Uncoated | | |
| No. 1 Antique (Watermarked) | 16.40 | 15.80 |
| Offset | 15.15 to 17.15 | 14.60 to 16.40 |
| A Grade E. F. | 15.40 | 14.85 |
| A Grade S. C. | 15.90 | 15.35 |
| B Grade E. F. | 15.15 | 14.55 |
| B Grade S. C. | 15.65 | 14.95 |

### Wood Pulp

Fourth Quarter

Domestic mill contract prices delivered with varying freight allowances.

| | Per Short ADT |
|---|---|
| Groundwood | $80.00/ $81.00 |
| Unbleached Sulphite | 124.00/ — |
| Bleached Sulphite | 125.00/ 135.00 |
| Bleached Soda | 130.00/ 135.00 |
| Bleached Sulphite | 155.00/ 165.00 |
| Unbleached Sulphate Northern | 120.00/ 130.00 |
| Unbleached Sulphate Southern | 110.00/ 125.00 |

### Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

| | Per Short ADT |
|---|---|
| Bleached Sulphate | $150.00/$160.00 |
| Unbleached Sulphate | 125.00/ 135.00 |
| Unbleached Sulphite | 125.00/ 126.00 |
| Bleached Sulphite | 125.00/ 135.00 |
| Glassine Unbleached Sulphite (no freight allowance) | 120.00/ — |
| Bleached Soda | 130.00/ — |
| Groundwood | 80.00/ 85.00 |
| Sideruns Pulping News | 80.00/ 90.00 |

### Swedish Quotations

On dock, Atlantic Ports

| | |
|---|---|
| Bleached Kraft | $165.00/ — |
| Bleached Sulphite | 165.00/ — |
| Unbleached Sulphite | 140.00/ 149.00 |
| Unbleached Kraft | 127.50/ — |

### Finnish Quotations

On dock, Atlantic Ports

| | Per Short ADT |
|---|---|
| Bleached Sulphite | $165.00/ — |
| Unbleached Sulphite | 140.00/ 143.00 |
| Unbleached Sulphate | 127.50/ — |

### Norwegian Quotations

On dock, Atlantic Ports

| | Per Short ADT |
|---|---|
| Bleached Sulphite | $165.00/$175.00 |

### New Domestic Cotton Cuttings

(Prices to Mill, F.o.b. Ship. Pt.)

| | | |
|---|---|---|
| White Shirt | $10.50/ | $11.00 |
| Unbleached Muslin | 11.00/ | 11.50 |
| Light Silesias | 8.25/ | 8.50 |
| White Back Blue Overalls | 7.50/ | 8.00 |
| Blue Overalls | 7.25/ | 7.75 |
| Fancy Shirt | 5.76/ | 6.25 |
| Percales | 6.50/ | 7.00 |
| Light Prints | 6.75/ | 7.25 |
| No. 1 Washables | 4.50/ | 5.00 |
| Bleachable Khaki | 6.75/ | 7.25 |
| Unbleachable Khaki | 6.00/ | 6.50 |
| Cottonades | 4.75/ | 5.25 |
| Lt. Flannelettes | 8.00/ | 8.50 |
| Men's Corduroy | 4.75/ | 5.25 |
| Women's Corduroy | 4.50/ | 5.00 |

### Old Domestic Cotton Rags

(Prices to Mill, F.o.b. Ship. Pt.)

| | Per 100 lbs. | |
|---|---|---|
| No. 1 Whites, Repacked | $5.00/ | $5.50 |
| No. 1 Whites, Miscellaneous | 4.00/ | 4.50 |
| No. 2 Whites, Repacked | 3.00/ | 3.50 |
| No. 2 Whites, Miscellaneous | 2.50/ | 2.75 |
| Blue Overalls | 3.50/ | 4.00 |
| Thirds and Blues Repacked | 2.75/ | 3.25 |
| No. 1 Roofing Rags | 1.40/ | 1.50 |
| No. 2 Roofing Rags | 1.25/ | 1.35 |
| No. 3 Jute Bagging | 1.15/ | 1.25 |
| No. 4 Brussels & hrd. bck'd crpts. | 1.25/ | 1.35 |
| No. 5A Roofing Rags | 1.25/ | 1.35 |

### New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

| | Per 100 lbs. | |
|---|---|---|
| New Dark Cuttings | $5.50/ | $5.75 |
| New Mixed Cuttings | 6.25/ | 6.50 |
| Light Silesias | 9.25/ | 9.50 |
| Light Flannelettes | 9.25/ | 9.50 |
| New White Cuttings | 12.00/ | 13.00 |
| New Unbleached Cuttings | 12.25/ | 13.00 |
| Fancy Shirt Cuttings | 6.50/ | 7.00 |
| Light Prints | 7.75/ | 8.00 |
| Bleachable Khaki, No. 1 | 7.00/ | 7.50 |
| Unbl. Khaki, No. 1 | 6.25/ | 6.75 |

### Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

| | Per 100 lbs. | |
|---|---|---|
| No. 1 White Cottons | — | / — |
| No. 2 White Cottons | — | / — |
| No. 3 White Cottons | — | / — |
| No. 4 White Cottons | 3.50/ | 3.75 |
| Extra Light Prints | 6.50/ | 7.00 |
| Old Light Prints | 4.50/ | 5.00 |
| Med. Light Prints | 4.00/ | 4.50 |
| Dutch Blue Cottons | 5.25/ | 5.50 |
| Checks and Blues | 3.25/ | 3.50 |
| Linsey Garments | 2.15/ | 2.25 |
| Dark Cottons, European | 2.00/ | 2.10 |
| Dark Cottons, Egyptian | 1.90/ | 2.00 |
| Old Shopperies | nominal | |
| New Shopperies | nominal | |

### Bagging

(Prices to Mill, f.o.b. N. Y.)

| | Per 100 lbs. |
|---|---|
| Foreign Gunny, No. 1 | $8.00/$8.50 |
| Domestic Gunny, No. 1 | 7.50/ 8.50 |
| Heavy Wool Tares | 7.50/ 7.75 |
| No. 1 Crap Bagging | 7.25/ 7.50 |
| Roofing Bagging | 1.10/ 1.20 |
| Foreign Manila Rope | 5.50/ 5.75 |
| Domestic Manila Rope | 6.00/ 6.25 |
| Jute Strings | 7.00/ 7.25 |
| No. 1 Sisal Strings | 5.25/ 5.50 |
| Mixed Strings | 1.50/ 1.75 |

### Waste Paper

Base Prices to Mills for Average Packings F.o.b. New York, Baled

| | (Per Ton) | |
|---|---|---|
| No. 1 Hard White Envelope Cuts | 100.00/ | 105.00 |
| No. 1 Hd. Wh. Shavings, unruled | 85.00/ | 90.00 |
| Super Soft White Shavings | 90.00/ | 95.00 |
| No. 1 Soft White Shavings | 65.00/ | 70.00 |
| No. 1 Fly Leaf Shavings | 45.00/ | |
| No. 1 Gd'wd Fly Leaf Shavings | 30.00/ | 35.00 |
| No. 1 Heavy Books & Magazines | 19.00/ | 21.00 |
| Mixed Books | 13.00/ | 15.00 |
| No. 1 White Ledger | 50.00/ | 60.00 |
| Col. Ledger | 40.00/ | 45.00 |
| Manila Tab. Cards | 60.00/ | 65.00 |
| New Manila Envelope Cuttings | 65.00/ | 75.00 |
| Extra Manilas | 20.00/ | 25.00 |
| Mxd. Kraft, Bag Cuttings | 55.00/ | 60.00 |
| Kraft Envelope Cuttings | 65.00/ | 75.00 |
| Triple Sorted, No. 1 Brown Soft Kraft | 40.00/ | 45.00 |
| New Kraft Corrugated Cuttings | 35.00/ | 40.00 |
| No. 1 Assorted Old Kraft | 35.00/ | 40.00 |
| Used Kraft Bags | 35.00/ | 40.00 |
| New Jute Corrugated Cuttings | 18.00/ | — |
| Old Corrugated | 14.00/ | 15.00 |
| No. 1 News | 13.00/ | 14.00 |
| No. 1 Mixed Papers | 6.00/ | 7.00 |
| Box Board Cuttings | 7.00/ | 8.00 |
| White Blank News | 65.00/ | 70.00 |
| Overissue News | 17.00/ | 18.00 |
| Sulphite Mill Wrappers | 12.00/ | 14.00 |

### Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

| | | |
|---|---|---|
| Coarse Polished—India | .35½/ | .36½ |
| Fine Polished India | .41½/ | .45 |
| Unpolished—Paper Makers | .32¼/ | .34½ |
| Tube Rope | .33¼/ | .35½ |
| Wrapping | .36 / | .38¼ |
| Cotton | .58 / | .60 |
| Polished Cotton | .55 / | — |

(Hard Fiber)

| | | |
|---|---|---|
| Mex. Sisal | .21 / | .27 |
| Manila (Reprocessed) | .31 / | .35 |

(American Hemp)

| | | |
|---|---|---|
| Polished Hemp | .46½/ | .48 |
| Unpolished | .35 / | .37¼ |

## PHILADELPHIA

### Domestic Rags (new)

(F.o.b. Eastern Shipping Point)

| | | |
|---|---|---|
| White Shirt | .10½/ | .11 |
| Light Silesias | .07½/ | .08 |
| Black Silesias, soft | .05½/ | .06 |
| Unbleached Muslin | .10½/ | .11¼ |
| Washable Prints | .06½/ | .07 |
| Washable No. 1 | .05 / | .05½ |
| Blue Overall | .07½/ | .08 |
| Washable Shredding | .02¾/ | .03¼ |
| Fancy Percales | .06¾/ | .07¼ |
| Unbleachable Khaki | .05½/ | .06¼ |
| Bleachable Khaki | .06¼/ | .06¾ |
| Men's Corduroy | .05½/ | .06 |
| Ladies' Corduroy | .05 / | .05½ |
| Cottonades | .05½/ | .06 |

### Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

| | | |
|---|---|---|
| White No. 1—Repacked | 4.50 / | 5.00 |
| Mixed White | 4.00 / | 4.25 |
| White No. 2—Repacked | 3.50 / | 3.75 |
| Thirds and Blues—Miscellaneous | 2.50 / | 2.75 |
| Repacked | 3.00 / | 3.25 |
| Domestic No. 1 Roofing Stock | 1.55 / | 1.60 |
| Domestic No. 2 Roofing Stock | 1.45 / | 1.50 |
| Roofing Bagging | 1.35 / | 1.40 |
| Old Manila Rope | — / | 5.50 |

### Bagging

(F.o.b. Eastern Shipping Point)

| | |
|---|---|
| Foreign Gunny No. 1 | nominal |
| Domestic Gunny No. 1 | .07¼/ .07¾ |
| Sisal Strings No. 1 | .04½/ .05 |
| Sisal Strings No. 2 | .03½/ .04 |
| Sisal Jute | .02¼/ .03 |
| No. 1 Scrap | .06½/ .07 |
| No. 2 Scrap | .03 / .03½ |

### Waste Papers

F.o.b. Phila. Mill Prices, Baled

| | Per Ton | |
|---|---|---|
| No. 1 Hd. White Envelope Cuts | 120.00/ | 125.00 |
| No. 1 Hd. Wh. Shavings, unruled | 100.00/ | — |
| Soft White Shavings | 85.00/ | — |
| White Blank News | 65.00/ | 75.00 |
| No. 1 White Ledger | 65.00/ | — |
| No. 1 Heavy Books & Magazines | 20.00/ | 22.00 |
| New Manila Envelope Cuttings | 75.00/ | — |
| No. 1 Assorted Old Kraft | 35.00/ | 40.00 |
| No. 1 Mixed Paper | 7.00/ | 8.00 |
| Box Board Cuttings | 8.00/ | 10.00 |
| New Kraft Corrugated Cuttings | 55.00/ | 60.00 |
| Old Corrugated | 14.00/ | 16.00 |
| Overissue News | 15.00/ | 16.00 |
| No. 1 News | 11.00/ | 13.00 |

## BOSTON

### Waste Papers

F.o.b. Boston, Mill Prices, Baled

| | Per Ton | |
|---|---|---|
| No. 1 Hd. Wh. Shav., unruled | $135.00/ | — |
| No. 1 Hd. Wh. Shavings, ruled | 90.00/ | — |
| Soft White Shavings | 120.00/ | 125.00 |
| No. 1 Fly Leaf Shavings | 45.00/ | — |
| No. 2 Fly Leaf Shavings | 40.00/ | 45.00 |
| No. 1 Grdwd. Fly Leaf Shvgs. | nominal | |
| No. 2 Groundwood Fly Leaf Shavings | nominal | |
| Mixed Colored Shavings | 30.00/ | — |
| New Manila Env. Cuts, one cut | 75.00/ | — |
| Hard White Envelope Cuts, one cut | 120.00/ | — |
| Triple S'ted No. 1 Br. Soft Kraft | 75.00/ | 80.00 |
| Mixed Kraft Env. & Bag Cuttings | 45.00/ | — |
| Kraft Envelope Cuttings | 80.00/ | 90.00 |
| No. 1 Heavy Books & Magazines | 22.00/ | — |
| New Manila Env. Cutt'gs, one cut | 47.00/ | — |
| New Manila Envelope Cuttings | 80.00/ | 85.00 |
| White Tabulating Cards | 80.00/ | 90.00 |
| White Blank News | 65.00/ | — |
| No. 1 Assorted Old Kraft | 50.00/ | — |
| No. 1 Mixed Paper | 8.00/ | 9.00 |
| Overissue News | 11.00/ | 12.00 |
| No. 1 News | 11.00/ | 12.00 |
| New Corrugated Cuttings, Kraft | 55.00/ | 60.00 |
| Old Kraft Corrugated Containers | 35.00/ | — |
| Old Corrugated Containers | 13.00/ | 14.00 |
| Paper Strings | 40.00/ | 45.00 |

### Bagging

(F.o.b. Boston)

| | (Per 100 lbs.) | |
|---|---|---|
| Foreign Gunny | nominal | |
| Domestic Gunny | 8.25 / | — |
| Domestic No. 1 Old Rope | 6.00 / | 6.50 |
| Foreign No. 1 Old Rope | 5.75 / | 6.00 |
| Mixed Strings | 1.35 / | — |
| Transmission Rope— | | |
| Domestic | 3.00 / | — |
| Jute Carpet Threads | — / | 4.00 |
| Bleachery Burlap | — / | 9.00 |
| Scrap Burlap— | | |
| Foreign | 6.75 / | 7.00 |
| Domestic | 7.00 / | 7.25 |
| South America | 6.75 / | 7.00 |
| Austr. Wool Pouches | 8.00 / | — |
| New Zealand Wool Pouches | — / | 5.50 |
| New Burlap Cuttings | 8.50 / | — |
| Heavy Baling Bagging | 8.00 / | 8.50 |
| Paper Mill Bagging | — / | 6.00 |
| No. 1 Roofing Bagging | — / | 1.40 |

### Domestic Rags (New)

(F.o.b. Boston)

| | (Per 100 lbs.) | |
|---|---|---|
| New Light Prints | nominal | |
| Fancy Percales | 7.00 / | — |
| White No. 1 Shirt | 11.00 / | — |
| Light Flannelettes | 8.00 / | — |
| Canton Flannels, Bleached | 10.00 / | — |
| Underwear Cutters, Bleached | 11.00 / | — |
| Underwear Cutters, Unbleached | 10.50 / | 12.00 |
| Silesias No. 1 | 7.25 / | — |
| Black Silesias | 4.50 / | — |
| Red Cotton Cuttings | 4.50 / | — |
| Blue Overalls | — / | 8.00 |
| Soft Unbleached | 11.00 / | — |
| Blue Cheviots | 7.00 / | — |
| Fancy | 5.50 / | — |
| Washable | 6.00 / | — |
| Khaki Cuttings | 6.00 / | — |
| Corduroy | 4.00 / | — |
| Men's Corduroy | 4.50 / | — |
| Khaki Canvas | — / | 6.00 |
| B. V. D. Cuttings | 11.00 / | — |

### Domestic Rags (Old)

(F.o.b. Boston)

| | Per 100 lbs. | |
|---|---|---|
| No. 1 Whites, Repacked | 4.75 / | 5.00 |
| No. 1 Whites, Miscellaneous | 4.25 / | 4.75 |
| No. 2 Whites, Repacked | 2.50 / | — |
| No. 2 Whites, Miscellaneous | 2.00 / | — |
| Twos and Blues, Repacked | 1.50 / | 1.75 |
| Old Blue Overalls | 4.00 / | 4.50 |
| Thirds and Blues, Repacked | 1.50 / | — |
| Black Stockings | 3.00 / | 3.50 |
| No. 1 Roofing Stock | 1.55 / | — |
| No. 2 Roofing Stock | 1.45 / | — |
| No. 3 Roofing Stock | 1.25 / | — |
| No. 4 Roofing Stock | 1.25 / | — |
| No. 5, Quality A. | 1.35 / | — |
| Old Manila Rope | 6.00 / | — |

## CHICAGO

### Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

| | | |
|---|---|---|
| Shavings— | | |
| No. 1 Hard White Envelope cuts, one cut | $100.00/ | — |
| No. 1 Hard White Shavings, unruled | 90.00/ | — |
| No. 1 Soft White Shavings | 80.00/ | — |
| No. 1 White Ledger | 60.00/ | — |
| No. 1 Heavy Books & Magazines | 28.00/ | 30.00 |
| White Blank News | 50.00/ | — |
| Mixed Kraft Env. & Bag Cuttings | 70.00/ | — |
| No. 1 Assorted Old Kraft | 25.00/ | — |
| Overissue News | 22.00/ | — |
| No. 1 News | — / | 18.00 |
| No. 1 Mixed Paper | 9.00/ | — |
| Old Corrugated | 14.00/ | 15.00 |
| Mill Wrappers | 11.00/ | — |

# Markets

### Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

### Bleaching Powder

Prices firm. Demand strong. Supply adequate. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l. works.

### Casein

Domestic prices firm. Manufacturers' holdings good. Demand light. Trading imported product dull. Current prices on processed acid precipitated casein at 28½ to 32 cents per pound for domestic grades and .26 to .28 cents for imported grades, f.o.b. shipping point.

### Caustic Soda

Easier demand has improved supply of liquid types. Export shipments tied up by railroad embargoes and dock strike. Flaked and solid still tight. 1949 contracts being written at adjusted levels. Contract renewals reported at present price levels. Solid caustic is reported at $3.10/$3.20 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.45 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt., at works.

### China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

### Chlorine

Pickup in demand and railroad embargoes tighten supply. Shortage of tankcars and multi-unit containers hampers delivery. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-tank cars, f.o.b., works.

### Rosin

Savannah and local markets quiet. Demand easier. Prices steady. Gum rosin in drums per 100 pounds net in car lots, f.o.b., Savannah; B, $6.50; G, H, I, K, $7.72. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

### Rosin Size

Heavy demand. Supply good. Seventy percent gum and pale wood grades, tank cars, $6.30 to $6.40, f.o.b. southern shipping point.

### Salt Cake

Supply somewhat easier. Heavy kraft production keeps demand steady. Production under contract. Domestic salt cake quoted at $27 00, f.o.b. shipping point, freight allowed to destination.

### Soda Ash

Eased demand from other industries and increased production makes supply condition favorable; deliveries close to schedule. Current prices sustained in some 1949 contracts. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

### Sodium Bicarbonate

Production good. Demand eased by better supply of other alkalis. Reported as $1.95 per cwt. paper bags, carload lots.

### Starch, Corn

Prices firm paralleling corn markets. Demand moderate. Supply ample. Pearl grade quoted at $5.41 per 100 pounds; powdered starch at $5.52 per 100 pounds; car lots, New York.

### Starch, Potato

Demand fair. Prices stronger following rise. Supply ample. High grade quoted at $4.80/$5.00 cwt. f.o.b. Idaho; $5.10/$5.25 f.o.b. Aroostook; Pearl grade $5.00/$5.15 cwt. f.o.b. Aroostook.

### Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

### Sulphur

Demand active. Supplies steady. Production up 3 percent. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $22.00 per long ton.

### Talc

Demand continues in excess of supply. Improvement seen by early 1949. Prices steady. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

### Tapioca Flour

High grades in good demand and only fair supply Steady improvement in buying noted. Superior highs range from $10.25/$11.50 cwt.; high grades $9.25 cwt., on dock Atlantic and Gulf ports; medium grades range from $6.00/$7.50 cwt., on dock N. Y. Coarse pearl grades, $5.00/$5.50 cwt., on dock N. Y. Medium and low grades in adequate supply.

### Titanium Dioxide

Supply of paper grades continues unequal to demand. Shipments on allocation. Improvement in supply delayed to 1951. Anastase 18c pound carload lots, 18½-19c l.c.l., rutile, 20c pound carload lots, 20½-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

## Exports Up 64,966 Tons

MONTREAL—Movement of Canadian newsprint past Canadian customs during September amounted to 405,551 tons, an increase of 64,966 tons over the corresponding month last year and 51,804 tons more than in August of 1948.

# Financial Record

| Preferred Stocks | Per Share Calendar Year 1947 | Earnings 12 Mos. to Approx. 9/30/48 | Indic. Annual Divid. Rate | Nov. 24 Closing Market Price |
|---|---|---|---|---|
| Armstrong Cork Co. $3.75 Cum. | $38.64* | $43.53*i | $3.75 | 95 |
| Armstrong Cork Co. $4.00 Cum. Conv. | 38.64* | 43.53*i | 4.00 | 108¼ |
| Celotex Corp. 5% Cum. | 24.25c | 26.25g | 1.00 | 18¾ |
| Champion Paper & Fibre $4.50 Cum. | 65.90f | | 4.50 | |
| Container Corp. of Amer. 4% Cum. | 102.74 | 98.49 | 4.00 | |
| Crown Zellerbach $4.20 Cum. | 56.40f | 55.07g | 4.20 | |
| Crown Zellerbach $4.00 Cum. Conv. 2nd | 211.39f | 217.70g | 4.00 | |
| Dixie Cup Co. $2.50 Cum. Conv. Cla | 9.16 | 9.61 | 2.50 | 49 |
| Flintkote Co. $4 Cum. | 81.91 | 87.68 | 4.00 | |
| Robert Gair Co., Inc. 6% Cum. | 18.01 | 15.97 | 1.20 | |
| International Paper Co. $4 Cum. | 236.51 | 242.27 | 4.00 | |
| Johns-Manville $3.50 Cum. | 128.81 | 175.15 | 3.50 | |
| Kimberly Clark Corp. 4½% Cum. | 70.03 | 82.79 | 4.50 | |
| Kimberly Clark Corp. 4% Cum. Conv. 2nd | 95.88 | 114.55 | 4.00 | 97 |
| MacAndrews & Forbes 6% Cum. | 62.20 | 59.89 | 6.00 | |
| Mead Corp. 4¾% Cum. | 81.56 | 80.43 | 4.25 | |
| Mead Corp. 4% Cum. Conv. 2nd | 53.34 | 51.89 | 2.00 | 32⅛ |
| Paraffine Cos. Inc. 4% Cum. Conv. | 152.76a | 158.96 | 4.00 | |
| Rayonier Inc. $2 Cum. | 13.58 | 16.09 | 2.00 | |
| St. Regis Paper Co. 4.40% 1st A | 76.93 | 85.00 | 4.40 | |
| Scott Paper Co. $3.40 Cum. | 43.95 | 54.31 | 3.40 | |
| U. S. Gypsum Co. 7% Cum. | 211.34 | 300.59 | 7.00 | 171 |
| United Wallpaper Inc. 4% Cum. Conv. | (d)1.35a | (d)6.28 | 2.00 | |
| West Virginia Pulp & Paper 4½% Cum. | 75.75c | 78.49g | 4.50 | |
| **Common Stocks** | | | | |
| APW Products Co. | $1.24 | $1.32 | $0.25 | 4½ |
| American Writing Paper Corp. | 1.61 | 0.02 | 0.25 | 5 |
| Armstrong Cork Co. | 6.41 | 7.17i | 2.60 | 47⅛ |
| Celotex Corp. | 6.59c | 7.15g | 2.00 | 24½ |
| Certain-Teed Prods. Corp. | 3.75 | 3.99 | 0.90 | 12½ |
| Champion Paper & Fibre | 5.57f | | 2.00 | 23⅜ |
| Congoleum Nairn Co. | 4.55 | 5.12i | 2.25 | 31⅛ |
| Container Corp. of America | 10.09 | 9.54 | 4.50 | 34⅞ |
| Crown Zellerbach | 6.81f | 6.53g | 2.00 | 25 |
| Dixie Cup Co. | 5.87 | 6.26 | 1.00 | 27 |
| Flintkote Co. | 6.27 | 6.28 | 3.00 | 29½ |
| Robert Gair Co. Inc. | 2.83 | 2.49 | 0.40 | 7¼ |
| Great Northern Paper Co. | 4.56 | 4.55 | 2.80 | |
| International Paper Co. | 15.02 | 15.39 | 5.00 | 52 |
| Johns-Manville Corp. | 3.17 | 4.28 | 2.00 | 37 |
| Kimberly-Clark Corp. | 4.29 | 5.16 | 1.65 | 21⅞ |
| MacAndrews & Forbes Co. | 3.68 | 3.53 | 2.50 | |
| Marathon Corp. | 3.39c | 3.93g | 1.40 | 21¼ |
| Mead Corp. | 7.33 | 7.11 | 2.00 | 16¼ |
| National Container Corp. | 4.13 | 3.11i | 1.20 | 9¾ |
| Paraffine Cos. Inc. | 2.40a | 2.50 | 1.20 | 20½ |
| Rayonier, Inc. | 7.30 | 8.88 | 2.00 | 27⅛ |
| Ruberoid Co. | 10.88 | 12.13i | 2.75 | 60½ |
| St. Regis Paper Co. | 2.66 | 2.86 | 0.80 | 9 |
| Scott Paper Co. | 3.02 | 3.79 | 2.50 | 47⅞ |
| Sutherland Paper Co. | 6.87 | 6.43 | 2.50 | 35½ |
| Taggart Corp. | 1.29 | | 0.60 | |
| Union Bag & Paper Corp. | 7.93 | 8.13 | 3.00 | 29 |
| United Board & Carton | 4.95b | 3.39h | 1.25 | 8⅛ |
| U. S. Gypsum Co. | 10.00 | 14.36 | 6.00 | 99¾ |
| United Wallpaper | (d)0.11a | (d)0.27 | —— | 3⅜ |
| West Virginia Pulp & Paper | 11.40c | 11.56g | 4.00 | 41½ |

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended 10/31/47
(d) Deficit
(f) Year ended 4/30/48
(g) 12 months to approximately 7/31/48
(h) 12 months to 8/21/48
(i) 12 months to approximately 6/30/48
(*) Pro forma

## Dividends Declared

*Kimberly-Clark Corp.* has ordered an extra dividend of 25 cents, payable December 22, and a regular quarterly dividend of 35 cents, payable January 3, both to stock of record December 10. No extra was paid a year ago.

*Consolidated Paper Co.* has declared an extra dividend of $1 per share, payable December 1, to stockholders of record November 20. The company previously declared a 25 cent dividend payable the same date, making $1.25 payable December 1. Dividends for the year 1948 now amount to $2.

*Powell River Co.* has declared an extra dividend of 65 cents per share, with the quarterly 40 cents. Both are payable December 15. An extra of 50 cents was paid June 15. Current declaration brings payments for 1948 to $2.75. A similar amount was paid last year. Net profit for the first six months was $3,400,086 equal to $2.53 a share compared with $3,062,106, or $2.28 for the 1947 period.

*Sutherland Paper Co.* declared an extra dividend of 25 cents and the regular quarterly dividend of 50 cents on its common stock, both payable December 15 to stock of record November 26. This brings the 1948 total to $2.50, as 25 cents extra was paid in September. The same amounts were paid in 1947.

*Mersey Paper Co., Ltd.*—Six months to June 30: Net profit, $1,074,162 or $5.01 each on 198,292 common shares. For all of 1947, net profit was $1,556,493, or $7.03 a share.

*Gaylord Container Corp.* on November 17 declared a dividend of 37½ cents a share on its common stock payable December 10, 1948, to shareholders of record December 2.

*Great Northern Paper Co.* declared an 80-cent extra dividend in addition to the 50-cent quarterly.

## Puget Sound Earnings

Puget Sound Pulp & Timber Co. reports a net profit of $4,468,339 from operations and capital gains in the first nine months of 1948, compared with $3,542,603 in the corresponding months of 1947. Each year's total includes $131,218 net capital gain. Stated on the present basis of capitalization for comparative purposes, these earnings are equal to $5.74 for the 1948 period against $4.77 for the 1947 period. Net sales from marketing pulp and by-products totaled $14,821,682 in the first nine months this year, against $11,188,074 in the corresponding period last year.

## "Industrial Speculation"

OTTAWA—An offering of 63,533 no-par-value common shares of Heaps, Waterous, Ltd., New Westminster, Canada, manufacturer of Machinery used in the pulp and paper industry, as an "industrial speculation", is being made by Fairclough & Co. Price is $4.50 a share.

## St. Regis Debentures

NEW YORK—The City Bank Farmers Trust Co. is trustee, paying agent and registrar for $10,000,000 St. Regis Paper Co., 15-year debentures 3⅝ per cent series due November 1, 1963, issued under a supplemental indenture dated November 1, 1948.

# Meetings

**ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.**

*NOVEMBER 29:* American Society for Testing Materials, Pittsburgh District, Mellon Institute.

*NOVEMBER 29-DECEMBER 4:* National Exposition of Power and Mechanized Engineering, Grand Central Palace, New York City.

*DECEMBER 2-3:* Insurance Conference, American Management Ass'n., Hotel Drake, Chicago.

**1949**

*JANUARY 13:* American Society for Testing Materials, Philadelphia District. Franklin Institute.

*JANUARY 20-21:* Finance Conference, American Management Ass'n. Hotel Pennsylvania, New York.

*FEBRUARY 3:* American Society for Testing Materials, New York District. Engineering Society Building.

*FEBRUARY 9:* Southern Pulpwood Conservation Ass'n. Atlanta Biltmore Hotel, Atlanta, Ga.

*FEBRUARY 10:* American Society for Testing Materials, Philadelphia District. McAllister's, 1811 Spring Garden Street.

*FEBRUARY 14-16:* Personnel Conference, American Management Ass'n. Palmer House, Chicago.

*FEBRUARY 20-25:* Annual Convention, American Paper & Pulp Ass'n. Hotel Waldorf-Astoria, New York. For details, write to E. W. Tinker, Executive Secretary, 122 East Forty-Second Street, New York 17, N. Y.

*FEBRUARY 22:* SAPI Luncheon, Hotel Waldorf-Astoria. For details, write to E. G. Amos, Secretary-Treasurer, Salesmen's Ass'n. of the Paper Industry, 122 East Forty-Second Street, New York 17, N. Y.

*FEBRUARY 28-MARCH 4:* Spring Meeting and A.S.T.M. Committee Week, American Society for Testing Materials. Edgewater Beach Hotel, Chicago.

*MARCH 17-18:* Marketing Conference, American Management Ass'n. Hotel Pennsylvania, New York.

*MARCH 22:* American Society for Testing Materials, Philadelphia District. Franklin Institute.

*APRIL 14-15:* Production Conference, American Management Ass'n. Hotel Pennsylvania, New York.

*MAY 10-12:* Packaging Conference, American Management Ass'n. Auditorium, Atlantic City, N. J.

*MAY 10-13:* Eighteenth National Packaging Exposition. Public Auditorium, Atlantic City, N. J. For details, write to Mr. James O. Rice, Sec., 330 West 42nd St., New York, N. Y.

*MAY 26-27:* Insurance Conference, American Management Ass'n. Hotel New Yorker, New York.

*JUNE 8-9:* General Management Conference, American Management Ass'n. Hotel Pennsylvania, New York.

*JUNE 15-17:* National Convention of the American Pulp and Paper Mill Superintendents Ass'n. Hotel Haddon Hall, Atlantic City, N. J.

*JUNE 17-18:* Paper and Twine Association. French Lick Springs, Indiana. For details, write to Mr. John L. Richey, Sec.-Treas., Suite 651-653, Hotel Sinton, Cincinnati 2, Ohio.

*JUNE 27-JULY 1:* Annual Meeting, American Society for Testing Materials. Chalfonte-Haddon Hotel, Atlantic City, N. J.

*OCTOBER 10-14:* West Coast Meeting, American Society for Testing Materials. (First national meeting of ASTM on West Coast.) Fairmont Hotel, San Francisco, California.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# Obituary

*James Abbatemarco,* 67, former president of the paper and paper products firm bearing his name at 109 Second avenue, Brooklyn, N. Y., died at his home in that borough on November 12, following an illness which overtook him last March. Surviving are his widow, Mrs. Nell Abbatemarco; three sons, Charles, Anthony and John; and a daughter, Mrs. Nicholas E. Leddo.

*Frederick L. Hecker,* 61, secretary of the Beacon Paper Co., St. Louis, died suddenly at his home in Ferguson, Mo., on November 12. Surviving are his widow, Mrs. Gussie E. Hecker; a son, Frederick L., Jr.; and a daughter, Miss Ruth L. Montag.

*Michael J. Baker,* superintendent of the Franklin Paper Co., Holyoke, Mass., died at his home on November 10 after a long period of illness.

## Trends

*(Continued from page 31)*

the spurt in new orders—probably late Christmas stockpiling—felt during the previous week had evaporated.

### Waste Paper

Eastern mills during the week ended November 13 purchased and consumed more waste paper than during any preceding week in the present quarter of the year. "In fact, dealers sold them more of the mixed grades than during any week since the middle of last June, and more news since any single week since last May. A few hundred tons of these grades were put into inventory," states Director Colley S. Baker of E.C.C.

### Indexes

Comparative ratios of U. S. paper and paperboard production to mill capacity, as reported by AP&PA are:

| | Nov. 13 1948 | Nov. 6 1948 | Nov. 15 1947 | Nov. 16 1946 | Nov. 15 1945 |
|---|---|---|---|---|---|
| Paper** | 100.8 | ‡97.0 | 109.1 | 104.9 | 96.4 |
| Paperboard | 96.0 | 95.0 | 101.0 | 101.0 | 95.0 |

** Indicates 1948 volume of 181,561 tons. Comparable week, 1947—172,905 tons. ‡ Revised.

### Paperboard Production (Tons)

| | Nov. 13 1948 | Nov. 6 1948 | Nov. 15 1947 |
|---|---|---|---|
| Production | 190,406 | 189,639 | 182,586 |
| New Orders | 167,198 | 244,448 | 154,639 |
| Unfilled Orders | 394,769 | 419,248 | 436,819 |

Percent of Activity, Current 96%; Year 96%

Index of general business activity for the week ended November 13 inclined to 153.3 from 152.4 in the preceding week, compared with 148.4 in the corresponding week of 1947.

Index of paperboard production rose to 187.0 from 186.1 in the preceding week, compared with 179.4 in the corresponding week of 1947.

## FAO Resources Restoration

WASHINGTON—The United Nations Food and Agriculture Organization is planning the initial steps of restoration of woodpulp resources in 1949 in various parts of the world, Norris E. Dodd, director general, stated on November 19.

"As preoccupation with the immediate problems of softwood lumber for reconstruction diminishes," Mr. Dodd said in opening the fourth annual conference of the FAO, "we are able to take the first practical steps in 1949 dealing with woodpulp, source of paper, the bulk of packaging material and of rayon."

"Our approach to forestry problems is regional," he continued. "First is staff exploration of regional problems, second, organization of a regional forestry and timber conference, and third, establishment of a regional working party staffed by FAO to serve as a permanent regional commission for forestry and forest products." This latter stage was begun in Europe last year, he said, and other parts of the world are in various phases of this program.

# Literature

*Bramson Publishing Co.,* 2842 W. Grand avenue, Detroit 2, Mich. Book, "American Mass Production" by Roy T. Bramson, editor of "Production Engineering and Management". Highlights the history of American mass production from the dreams of inventors to feats of production engineering. The author traces the evolution of vehicles from colonial coaches and pioneer wagons to the cars of today. Almost every production field gets similar attention, from nails and pins, telephone and telegraph, to soap, furniture and paper. Pictures, facts and anecdotes make this a scrap book of production history.

*Pittsburgh Plate Glass Co., Columbia Chemical Div.,* Fifth avenue at Bellefield, Pittsburgh 13, Pa. Technical manual, "Chlorine". Designed for use by operators, technicians, buyers and executives, the new manual presents charts, diagrams and photographic illustrations concerned with the production and handling of chlorine and several of its end-products. After tracing highlights in the history and growth of the industry, "Chlorine" enters a detailed discussion of the methods of manufacture, handling and unloading. Safety precautions, shipping, equipment and construction materials re-

ceive detailed consideration. Presents a minute study of the properties of chlorine, the preparation and analyses of several bleach liquors and detailed conversion information.

*Paper Cup and Container Institute, Inc.*, 1790 Broadway, New York 19, N. Y. Booklet, "Portion Control and Food Cost Manual", by George I. Wenzel, former Director of American Restaurant Institute; Director, Institute of Fine Cooking; Author of "American Menu-Maker", "Wenzel's Menu-Maker"; Associate Professor, Texas University; Lecturer at University of Minnesota; Restaurant Consultant. A study sponsored by the Portion Cup Manufacturers designed to inform restaurant managers as to the manner in which restaurant men and women throughout the country are handling food cost problems in times of high costs. Provides a simple, complete and authoritative report on portion control. Price $1.00.

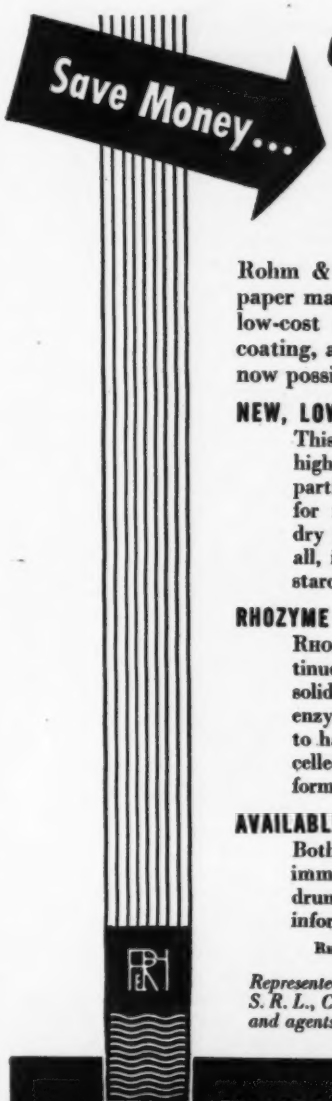
*Mathieson Chemical Corp.*, 60 East 42nd street, New York 17, N. Y. Booklet, "Mathieson Chlorine". Intended primarily to provide information on the proper handling of liquid chlorine. Subjects covered include the shipment and storage of liquid chlorine with data on chlorine cylinders, ton containers and tank cars, methods of handling dry and moist chlorine, and safety in the use of chlorine, including first aid for chlorine exposure. Also contains detailed information on the physical properties of chlorine, including tables and charts listing the vapor pressure, density, specific volume viscosity, specific heat and surface tension of liquid chlorine at various temperatures.

*Noble & Wood Machine Co.*, Hoosick Falls, N. Y. Booklet, "Propeller Agitators for the Pulp and Paper Industry". Indicates a few of the successful applications in pulp and paper mills, for constant, thorough application; complete color mixing; accelerating fibre hydration; increasing beater output; uniform stock blending; high density stock circulation. Cuts and schematic diagrams of actual installations in prehydration or storage chests, fast circulating beaters, mixing or blending tanks, concrete or tile chests, beater drop chests, small, large, or extra large vertical chests, extractor rings, and modern breaker units present effective information.

*Brown Instrument Co.*, Div. of Minneapolis-Honeywell Regulator Co., Wayne & Roberts avenues, Philadelphia 44, Pa. Catalog #7000, "Pressure and Vacuum Gauges". Carries full and complete description of indicating and recording gauges, pressure controllers and regulators; also features pressure actuating elements, high vacuum gauges, control components (including Electr-o-Vane electronic controller), the Air-O-Larm system, Integral Control By-Pass, and Liquid Level Measurement of open and closed vessels. Well illustrated with clear schematic drawings, photographs and diagrams; also includes pressure range charts and indicating scales.

*Electric Steel Foundry Co.*, 2141 N.W. 25th avenue, Portland 10, Oregon. Catalog, #168, "Esco Stainless and High Alloy Steels". Variety and range of types of products included is extensive enough to be of interest and value to practically all industries whose operations in any phase involve equipment subject to extraordinary corrosion, heat or abrasion. Examples are shown from cement kiln and cooler parts (heat resistant), to ball mill grates, liners and crusher parts (abrasion resistant), to heat exchangers, piping, stainless valves, etc. (corrosion resistant).

*National Bearing Div., American Brake Shoe Co.*, 4930 Manchester avenue, St. Louis 10, Mo. Bulletin, "Silver Babbitt Solves Your Bearing Problems". Briefly relates story of silver babbitt's development, lists its essential bearing properties, its advantages, physical properties and recommended applications.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The solenoid valve, 150-lb. globe type, intended for service in which the valve is normally open, is designed to remain closed for indefinite periods of time. It is stated that when an emergency arises, the control element immediately causes the solenoid to be energized, thus closing the valve instantly; and since the valve closes with the pressure and flow, it will remain closed as long as a pressure above three pounds exists on the inlet side, regardless of whether or not the solenoid continues to be energized. To permit easy opening of the valve when the emergency has passed, a simple piping arrangement is utilized. A ⅛" pipe, branching from main inlet pipe, bypasses the inlet side of the valve and leads directly into the chamber on the outlet side. Flow through this pipe is controlled by a ⅛" globe valve. Opening equalizes pressure above and below disc, thereby allowing the solenoid-controlled valve to open. (It is necessary that there be a shut-off valve in the outlet piping if it is not dead-ended, the manufacturer states.) Globe valve is then closed and ready for the next emergency. Series No. 6000 valve is constructed with heavy cast body suitable for pressures to 150 lbs., and comes furnished with Jenkins disc to handle steam, hot or cold water, gas, air, gasoline or oil. Available in six sizes from ¼" to 2½". May be used on 110, 220, 440-volt 60 cycle a.c., and is provided with a ⅛" I.P.T. opening the cap. For details and prices write to Johnson Corp., Three Rivers, Mich.


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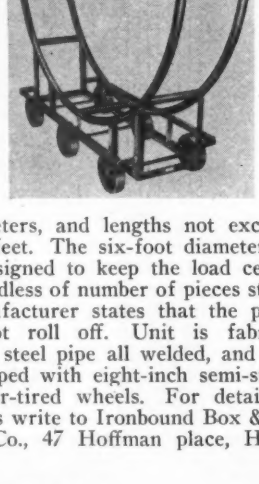


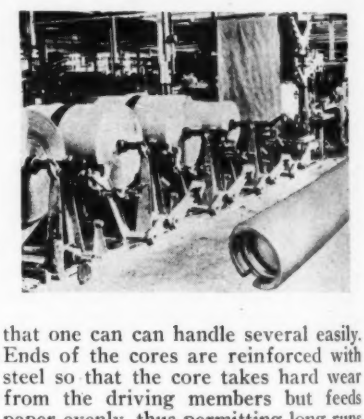
diameters, and lengths not exceeding five feet. The six-foot diameter body is designed to keep the load centered regardless of number of pieces stacked. Manufacturer states that the product cannot roll off. Unit is fabricated from steel pipe all welded, and comes equipped with eight-inch semi-steel or rubber-tired wheels. For details and prices write to Ironbound Box & Lumber Co., 47 Hoffman place, Hillside, N J.

## Pervenactor

The Pervenactor, a heat seal label activator, was developed to activate the manufacturer's delay action heat seal label paper, Pervenac (formerly known as Thermo-Kote). Pervenac labels are fed by hand into a slot in top of machine behind the heater roll, are carried through the activator and ejected, adhesive face up, fully activated and ready to use. Activation is thermostatically controlled by means of a roll heater which directs the heat into the precoated adhesive face of the label. Activator weighs about 20 pounds, is designed to handle a label to 4 inches in width, is powered by a 1/70 horsepower, 110-volt a.c. motor. Pervenac labels are said to remain tacky for several minutes after passing through the Pervenactor. Can be applied to curved or several-sided surfaces, to tin, stainless steel, wet glass, and many surfaces to which conventional water moistenable labels refuse to stick. For details and prices write to Nashua Gummed and Coated Paper Co., Nashua, N. H.

## Rigid Aluminum Core Stock

Rigid Aluminum Paper Cores, made from a tough heat-treated alloy especially for handling paper, are said to be strong enough to prevent crushing or collapsing when supporting heavy rolls of paper yet so light, when empty,



that one can can handle several easily. Ends of the cores are reinforced with steel so that the core takes hard wear from the driving members but feeds paper evenly, thus permitting long runs without costly shut-downs or delays. The strong, lightweight aluminum construction is said to withstand the rough handling during shipping without damage, also to provide special advantages and economies because it cannot rust, also remains clean for long periods. Core stock is being supplied to fabricators who cut to length and insert steel ends for driving members. In some instances, paper mills themselves insert the steel ends. For details and prices write to Reynolds Metals Co., 2500 So. Third street, Louisville, Ky.

## Chemistry in Canada

MONTREAL—The Chemical Institute of Canada will launch a monthly technical and news magazine next April, it was disclosed on November 15 following a meeting of the board of directors. At the meeting, Dr. S. A. Beatty of the Fisheries Experimental Station at Halifax was named chairman of the 1949 conference committee which will function under guidance of the director of national meetings, Dr. D. M. Morrison.

## New Sandy Hill Combine

NEW YORK—Frank A. Juckett, president of the Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., on November 24 confirmed to the editorial offices of *Paper Trade Journal* that an arrangement has been consummated by his firm with the Newport News Shipbuilding & Drydock Co., Newport News, Va., whereby they are now in position to furnish pulp and paper mill machinery to suit any and all requirements, in any size from the smallest to the largest.

The well-known Sandy Hill engineering and design staff, plus the added facilities of the famous shipbuilding organization now gives the pulp and paper mills another source of supply capable of meeting demands for faster and larger size paper machines.

## Laying Off Loggers

WASHINGTON—Increased lay-offs in logging camps and sawmills were reported for September by the Bureau of Labor Statistics on November 20, attributed to the West Coast longshoremen's strike which tied up shipment of logs and lumber products.

For paper and allied products, employment figures reported by the agency showed total accessions for September at a rate of 3.1 per 100 employees, against 3.3 in August, and a discharge rate of .3 per 100 for both months. For paper boxes, the rate of accessions was 5.8 for September and August, against a discharge rate of .6 in September, and .5 in August, and a quit-rate of 4.9 and 4.2 for the two months respectively.

## ECA Authorizations

WASHINGTON—Pulp, paper and paper products for various recipient countries continued to feature the authorizations of ECA during the week ended November 20.

Latest additions to the list included: Italy, fourth quarter 1948, pulp, paper and paper products, $672,000; for first quarter 1949, pulp, paper and paper products, $1,008,000; for the United Kingdom, for fourth quarter, 1948, an increase of $400,000 in the procurement authorizations of pulp, paper, and paper products, all for purchase in the United States.

## Robinson to Koppers

BALTIMORE — McMillan Robinson of Philadelphia was named sales manager for the Metal Products Division of the Koppers Co., Inc., on November 20. The Koppers Metal Products Division was formed last August, to combine the company's manufacturing activities in the Baltimore area under one management. The company operates two Baltimore factories, one making gas-producing and storing equipment, couplings, precipitators, airplane propellers, and coke-oven equipment, while the other produces automotive, aviation, and industrial piston rings.

## Goldsmith to Speak

KALAMAZOO, Mich.—Philip H. Goldsmith, sales and development engineer of the Pusey & Jones Corp., Wilmington, Del., will be the speaker at the meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Ass'n., to be held on December 16 at 6:30 p.m. at the Hotel Harris.

The subject before the meeting will be "Paper Machine Developments." Mr. Goldsmith will present a complete discussion of the "Flow Spreader" and other recent improvements in paper machine design, Olin W. Callighan, secretary - treasurer of the Michigan Division, reports.

## Midvale Names Riley

PHILADELPHIA — The Midvale Co. has appointed the John C. Riley Co., 407 Scanlan building, Houston 2, Tex., as its district sales representative in Louisiana, Arkansas, Oklahoma and Texas, H. M. Givens, Jr., manager of bar steel sales, reports.

## SPMA Sec'y. Honored

NEW YORK—Thomas J. Burke, secretary-treasurer of the Sulphite Paper Mfr's., Ass'n., was presented recently with a silver Award for Distinguished Service by the American Trade Ass'n.,

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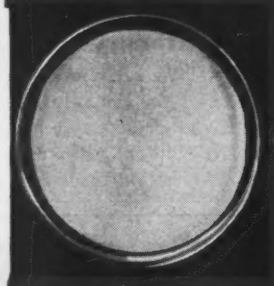

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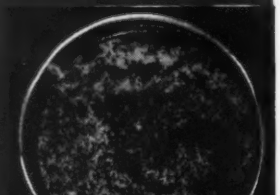

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The food industry is making increasing use of low-cost Dow propylene glycol because of its unusual properties as a solvent, humectant, preservative, and wetting agent. Through the wetting action of this highly purified material it has been found possible to extend the effectiveness of shortening in producing baked goods. Propylene Glycol aids in the dispersion of the shortening throughout the batch with a consequent saving of critical shortening not otherwise possible.

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# Anaerobic Decomposition of Strawboard Wastes*

By Don E. Bloodgood[1] and James C. Hargleroad[2]

**Abstract**

*The losses of solid matter in the processing of straw amounts to about 30% of the total raw material shipped to a mill. Of the material lost in wastes, a large part of it is organic in nature and serves as food for micro-organisms. A very large portion of the organic matter is colloidal or dissolved and cannot be removed by sedimentation; consequently, there remains a very strong waste even after settling. There are two methods used for removing dissolved organic matters (1) chemical coagulation, and (2) biological conversion. The first was investigated and found to be expensive and did not produce an effluent that could be discharged into a small stream. The trickling filter has been effective in treating some of the strong wastes of other industries and would, it was believed, be economical and efficient in treating strawboard waste. Tests were run on a pilot plant trickling filter at the No. 2 mill of the Terre Haute Paper Company for nine months in 1946-1947 and it was concluded that it was not possible to obtain effluents with B.O.D.'s below 139 if the filter was loaded heavier than 0.55 pounds per cubic yard per day. Such low loadings and high B.O.D. effluents led to the conclusion that the trickling filter was not effective or efficient in the treatment of strawboard waste.*

*Returning to laboratory studies, investigations were carried on to determine the effectiveness of anaerobic treatment of strawboard wastes. Early tests had indicated possibilities with this type of waste treatment. A small laboratory digestion tank was operated for ten months on settled strawboard wastes. During this period the digestion tank was operated at 37, 30 and 25° C. The quantities of material added were varied so that a range of loadings and digestion periods could be obtained. An effluent with 66 p.p.m. of B.O.D. was obtained while operating with a 1.5 day detention period at a temperature of 37° C. and with an influent B.O.D. of 954 p.pm. The quantity of combustible gas produced amounted to 660 ml. per gram of B.O.D. removed. Data at the other digestion temperatures show the effect of temperature upon the rate of decomposition. At the 25° C. temperature (the temperature of straw mill wastes) rapid rates of B.O.D. reduction were obtained. It is expected that a pilot plant will be built to try out on a larger scale the operation of this promising process of strawboard waste disposal.*

In reports *(1, 2)* of the progress of the research on the disposal of strawboard wastes, the characteristics of the total waste have been indicated. During an eight months period (June 1, 1946 to January 31, 1947, inclusive) it was possible to obtain composited samples of total waste and have daily analyses made on them. These data certainly provide a very representative picture of the nature of the wastes that may be expected from a strawboard mill. The volume of water used by any particular mill may be greater or less than that shown in Table I and thereby affect the concentration of the constituents in the waste, but it is reasonable to assume that the total amount of organic matter that must be disposed of from a strawboard mill will be proportional to the tons of straw processed in the mill. The type of straw and its quality will have some bearing upon the amount of waste that must be disposed of. Calculations made with the data in Table I show that the waste from a mill producing 100 tons of paper per day is equivalent

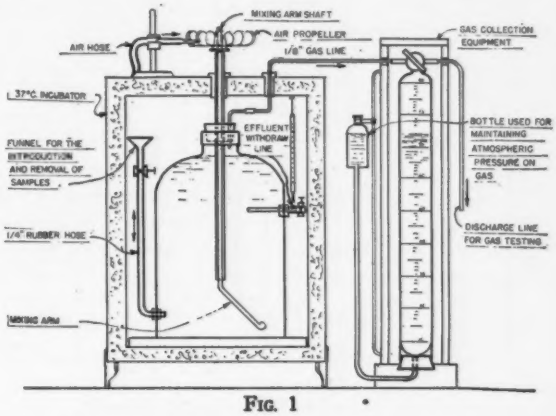


FIG. 1

Equipment Used in Digestion Tank Experiment

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Professor of Sanitary Engineering, Purdue University.

[2] Assistant Superintendent, Hammond Sanitary District, Hammond, Ind. Formerly Graduate Assistant in Sanitary Engineering, Purdue University.

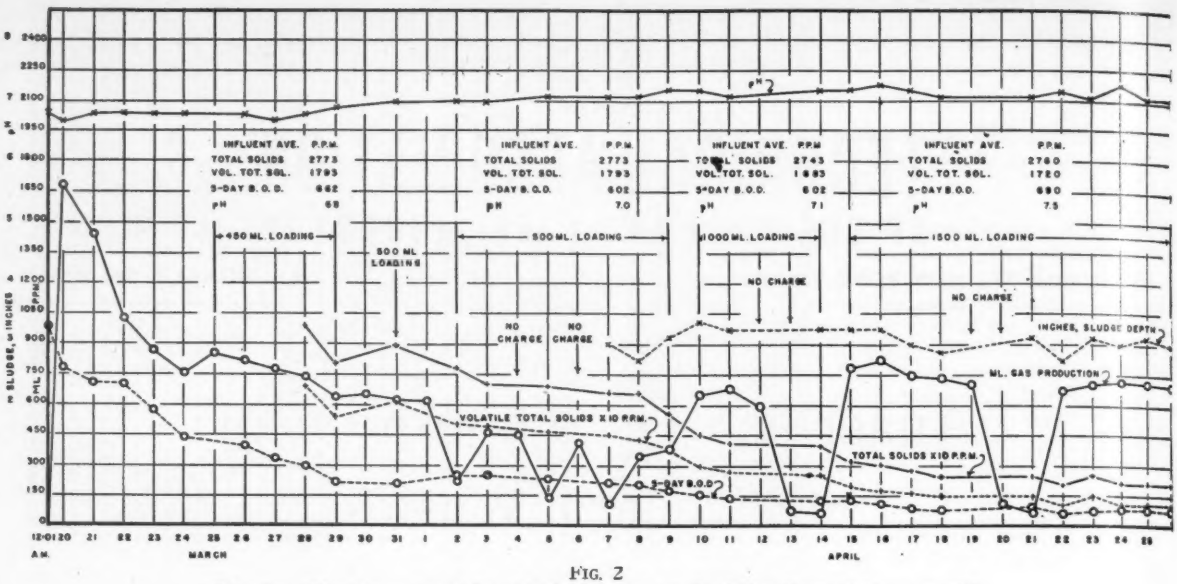


FIG. 2

**Laboratory Digestion of Settled Strawboard Waste 37° C. Incubation March 19-August 1, 1947**

to the sewage from a city with a population of 163,000. The disposal of such a quantity of organic waste is certainly an undertaking for any company or mill. It was hoped that it might be possible to accomplish reductions of the organic material in the strawboard waste by primary sedimentation and trickling filters. The pilot plant studies made at Terre Haute reported on by Stahl *(3)* and more completely by Hargleroad *(4)* indicated quite conclusively that the trickling filter could not produce a satisfactory effluent if it was loaded with B.O.D. at application rates that would be considered economically feasible in terms of original plant construction costs.

Studies made by Erganian *(5)* in 1945 indicated that the B.O.D. of strawboard waste was reduced when samples were held at 37°C. Other quite similar tests by Erganian showed that sometimes no reduction of B.O.D. takes place when allowed to stand at room temperatures. Preliminary experiments were made to determine whether the reduction was a result of aerobic or anaerobic decomposition. As soon as it was certain that the organisms would live under anaerobic conditions it was decided to proceed with well controlled experiments. It

TABLE I.—CHEMICAL CHARACTERISTICS TOTAL STRAWBOARD WASTE, P.P.M.

| Date | Tons of Strawboard Produced | M.G.D. of Waste Waters | Total Solids | Total Volatile Solids | Suspended Solids | Suspended Volatile Solids | 5 Day B.O.D. |
|---|---|---|---|---|---|---|---|
| | June 3-June 30 | | | | | | |
| June, 1946 | 3029.5 | ... | 3660 | 2340 | 1190 | 738 | 897 |
| | July 1-July 29 | | | | | | |
| July | 2855.0 | ... | 3280 | 2120 | 998 | 675 | 923 |
| August | .... | ... | 3280 | 2210 | 1600 | 748 | 889 |
| September | .... | 3.52 | 3610 | 2330 | 1270 | 866 | 920 |
| October | .... | 3.58 | 3770 | 2610 | 1610 | 1080 | 966 |
| November | .... | 3.43 | 4030 | 2750 | 1760 | 1130 | 1038 |
| December | .... | 3.30 | 4100 | 2880 | 1690 | 1120 | 1008 |
| Jan., 1947 | .... | 3.48 | 3800 | 2680 | 1360 | 916 | 996 |
| | Tons per Day | | | | | | |
| Average | 105 | 3.46 | 3691 | 2449 | 1435 | 909 | 955 |

33,000 gallons of waste per ton of paper produced.
273 pounds of B.O.D. per ton of paper produced.

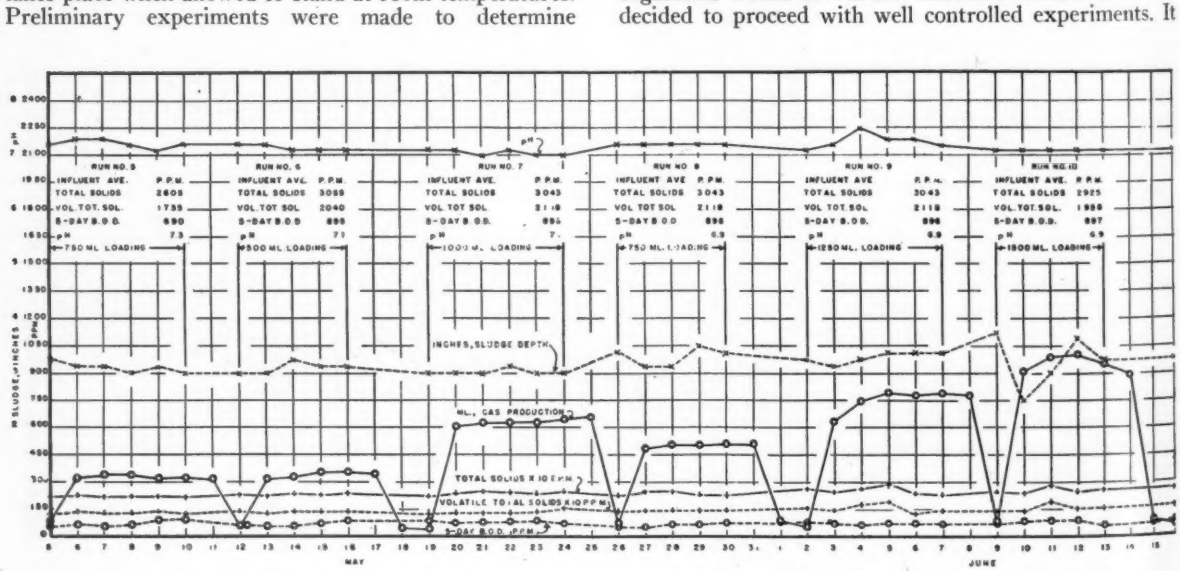


FIG. 3

**Laboratory Digestion of Settled Strawboard Waste 37° C. Incubation March 19-August 1, 1947**

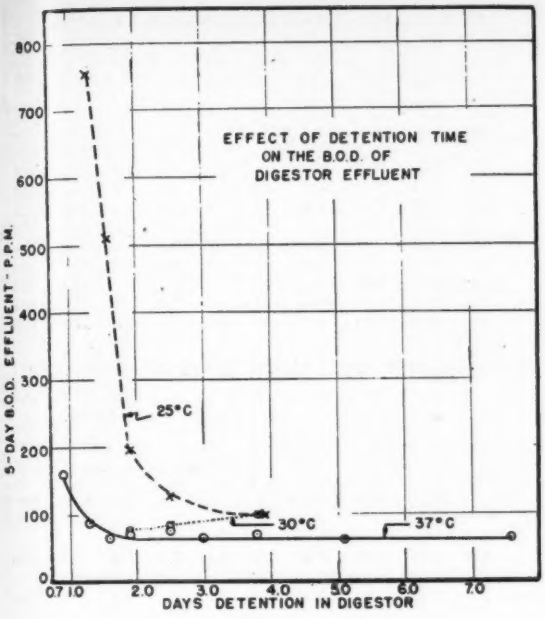


FIG. 4

was hoped that the studies might lead to a method of treatment that was not as costly as aerobic processes or that the B.O.D. could be sufficiently reduced so that treatment could be completed in aerobic process plants of reasonable size and cost. Earlier studies *(1)* have shown that most of the 5-day B.O.D. is in the dissolved material in the waste waters. Studies on the digestion of strawboard waste sludge reported by Eldridge *(6)* showed that the sludge can be digested but at a rate much too slow for practical detention times for the total flow of waste from a mill. These findings lead to the belief that the "High-Rate Digestion" should be tried on primary settled strawboard waste.

## Laboratory Studies

### Equipment Used in the Tests

The digestion tank for the laboratory studies was a 1-gallon jug drilled for inlet and withdrawal openings as shown in Fig. 1. An air motor was used to stir the contents of the digester. The jug was placed in an incubator so that uniform temperatures could be maintained. The gas was collected in a 1000 ml. flask inverted in a container of water.

### General Procedures

The seed sludge used to inoculate the digester was obtained from a strawboard lagoon at one of the near-by strawboard mills. The seed sludge was black in color and looked like a very wet leaf mold or well digested sewage sludge.

The mill waste used in the experiments was obtained periodically as catch samples at one of the mills. The samples of waste were stored at 3°C. until they were prepared for charge to the digester. The settled waste was prepared by vigorously shaking a carboy of total waste, allowing it to settle for 2 hours, and then siphoning the supernatant into another carboy. The settlings were discarded. The settled waste was stored in the refrigerator. Portions of the refrigerated sample were used as charges to the digestion tank after first warming it to the digestion tank temperature.

The digester was filled with 3800 ml. of liquid, one-fourth was digested sludge and three-fourths was settled strawboard waste.

In operating the digester the agitator would be stopped 1 hour to permit settling before drawing supernatant. The charge and withdrawal was always equal in order to maintain a constant level in the tank. The gas was measured once or twice per day by withdrawing to the gas buret and measuring it at atmospheric pressure. Sludge withdrawals of 500 ml. were made when the depth of sludge after settling for 1 hour was over 4 inches. Laboratory analyses included total solids, total volatile solids, and B.O.D. on influents and effluents. A few analyses were made for carbon dioxide in the gas. During some of the heavier loadings volatile acids were run on the effluent from the digester.

It was not possible to obtain fresh samples of waste each day and, as was previously mentioned, the waste used for the charges was stored in a refrigerator until needed. It was believed that the waste might under-go some change during the storage. To obtain information on this, samples were taken periodically and analyses made. In some instances the pH decreased considerably but only in a few instances did it fall below 7.0. The most alkaline sample had a pH of 8.5. There was quite a definite indication that the B.O.D. of samples may increase with storage time up to a certain point and that with further storage a decrease in B.O.D. was observed.

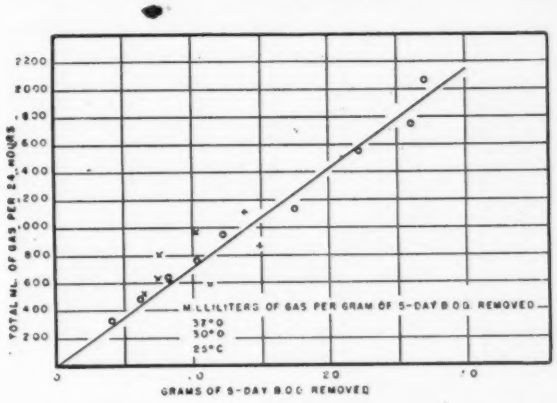


FIG. 5

A possible explanation of this would be that, upon standing, there were changes that took place which made additional organic matter available for oxidation in the 5-day B.O.D. incubation period. Reductions in B.O.D. concentration after the rise might be due to the oxidation of portions of the organic matter in the sample. Some of the observations made by Erganian *(1)* substantiate these statements. There was no indication that the changes had any effect upon the operation of the experimental digestion tank.

The test apparatus was operated for almost a month before it was reasonably certain that the gas production was no longer appreciably affected by the decomposing seed sludge.

The data on gas production were used in indicating rates of reduction of organic matter in the digester.

### Digestion Experiments at Different Temperatures

Fourteen loading conditions at 37°C, three at 30°C, and six at 25°C were undertaken during the course of the 9 months of operation of the experimental unit.

To eliminate the interference that the seed sludge

might have had upon the results of the test, the period of March 20 to May 11 has not been used in showing any relations. In other words, it took 2 months of operation before it could be safely said that the operation was consistent. It was, however, actually only 28 days from the start before the effluent being drawn had a B.O.D. of less than 100 p.p.m. The effect of the seed sludge can be seen in Fig. 2,. During the first 5 days there was a marked decrease in daily gas production, then on the 25th of March a small charge increased the gas production a small amount. Observation of the amounts of gas produced on April 2, 5, 7, 13, and 14 showed that there was a continued reduction until a relatively constant amount of gas was produced each day when there were no loadings to the digester. The immediate decrease in gas production after a day of no load and the immediate increase, after a charge was made, indicated that the organic matter was converted in a very short time in the digestion tank.

Figure 3 again shows the resulting gas production when no charge was made to the digester. Attention is called to this particular data because it shows that the same volume of a different concentration of B.O.D. results in a marked difference in gas production and the gas production seems to be an excellent way of measuring the activity in the digestion tank. The periods of particular interest in Fig. 3 are May 5 to 11 and May 26 to 31 showing gas productions with 750 ml. loadings and B.O.D.'s of 690 and 896 p.p.m.

In general, a particular loading was made on from 5 to 8 days in order to obtain information upon the behavior of the digester under different conditions of temperature, detention time, and loading. Tables II and III are summaries of the operation under the different conditions.

The data in Table II indicate that even with a detention time of 0.9 days at 37°C. there seemed to be no indication that the digestion tank was not in good operating condition. The pH was the same 7.1 figure that it had been for the other longer detention tests at the same temperature and the gas production per pound of total volatile solids or pound of B.O.D. had not changed materially. It is true, however, that the effluent did not have as low a B.O.D. as when the longer detention periods were used.

Only enough runs were made at the 30°C. temperature to establish a relation with the 37°C. studies. Table III shows that effluents of 100 or below were produced with detention periods as short as 1.9 days. There were no indications that the digester was not operating with satisfactory pH and gas production. The quantity of gas per

TABLE II.—DIGESTION EXPERIMENTS AT 37° C.

| Run No. | Detention Time Days | Total Volatile Solids, p.p.m. Influent | Total Volatile Solids, p.p.m. Effluent | B.O.D. p.p.m. Influent | B.O.D. p.p.m. Effluent | pH Influent | pH Effluent | Cubic Feet Gas per Pound Tot. Vol. Sol. Added | Cubic Feet Gas per Pound Tot. Vol. Sol. Removed | Cubic Feet Gas per Pound B.O.D. Removed |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.9 | 2284 | 1525 | 839 | 162 | 7.4 | 7.1 | 3.6 | 10.0 | 12.3 |
| 2 | 1.3 | 2183 | 1563 | 954 | 89 | 6.9 | 7.2 | 4.3 | 15.1 | 10.8 |
| 3 | 1.5 | 2183 | 1586 | 954 | 66 | 6.9 | 7.3 | 4.6 | 16.7 | 11.2 |
| 4 | 1.9 | 2183 | 1501 | 954 | 71 | 6.9 | 7.1 | 3.9 | 12.5 | 10.3 |
| 5 | 2.5 | 1958 | 1538 | 897 | 75 | 6.9 | 7.1 | 5.2 | 24.0 | 12.6 |
| 6 | 3.0 | 2118 | 1526 | 896 | 65 | 6.9 | 7.3 | 4.6 | 16.5 | 11.8 |
| 7 | 3.8 | 2118 | 1336 | 896 | 70 | 7.1 | 7.1 | 4.7 | 12.8 | 12.2 |
| 8 | 5.1 | 2118 | 1423 | 896 | 61 | 6.9 | 7.2 | 5.0 | 15.1 | 12.6 |
| 9 | 7.6 | 2040 | 1264 | 896 | 66 | 7.1 | 7.1 | 5.2 | 13.7 | 12.8 |

TABLE III.—DIGESTION EXPERIMENTS AT 30 AND 25° C.

| Run No. | Detention Time Days | Total Volatile Solids, p.p.m. Influent | Total Volatile Solids, p.p.m. Effluent | B.O.D. p.p.m. Influent | B.O.D. p.p.m. Effluent | pH Influent | pH Effluent | Cubic Feet Gas per Pound Tot. Vol. Sol. Added | Cubic Feet Gas per Pound Tot. Vol. Sol. Removed | Cubic Feet Gas per Pound B.O.D. Removed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 30° C. | | | | | |
| 1 | 1.9 | 2123 | 1178 | 764 | 75 | 7.4 | 7.3 | 4.2 | 9.5 | 13.0 |
| 2 | 2.5 | 2331 | 1294 | 1082 | 84 | 7.0 | 7.3 | 4.2 | 9.0 | 9.3 |
| 3 | 3.8 | 2178 | 1205 | 938 | 101 | 7.2 | 7.1 | 4.5 | 10.1 | 11.9 |
| | | | | | 25° C. | | | | | |
| 1 | 1.3 | 3277 | 2474 | 1133 | 755 | 7.2 | 6.6 | 0.9 | 4.0 | 8.4 |
| 2 | 1.5 | 3078 | 2034 | 782 | 512 | 8.4 | 6.8 | 1.3 | 3.9 | 15.3 |
| 3 | 1.9 | 2253 | 1574 | 710 | 196 | 7.1 | 7.1 | 3.5 | 11.6 | 15.3 |
| 4 | 2.5 | 2344 | 1493 | 632 | 127 | 7.0 | 7.3 | 3.7 | 10.3 | 17.3 |
| 5 | 3.8 | 2563 | 1475 | 741 | 101 | 7.5 | 7.0 | 3.3 | 7.8 | 13.3 |

unit of volatile solids removed seemed to be some lower for the 30°C. tests.

The studies at 25°C. were made because this is about the average waste temperature from some of the mills. With a 3.8 day detention, an effluent B.O.D. of about 100 p.p.m. was obtained. Appreciable reductions were obtained with shorter digestion times without an apparent upsetting of the digester. With digestion periods under 2 days there was a drop in the pH and the gas production per unit of total volatile solids (both added and removed) and the B.O.D. of the effluent was usually much lower for digestion periods longer than 2 days. These points are brought out in Table III and the B.O.D. in the effluent are shown in Fig. 4.

Figure 5 shows that the quantity of gas produced was proportional to the grams of B.O.D. removed. Figure 6 shows that, in general, every gram of volatile solids had a B.O.D. of 0.37 grams.

During the preliminary stages of the experiment, the digester effluent was black and had a strong odor. As digestion became well established, the effluent took on a

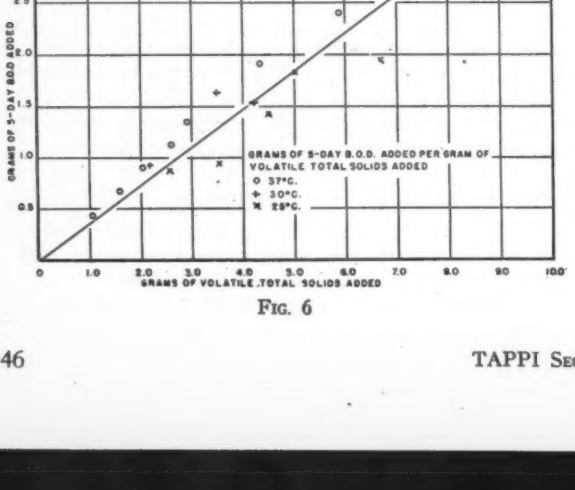
GRAMS OF 5-DAY B.O.D. ADDED
GRAMS OF VOLATILE TOTAL SOLIDS ADDED
GRAMS OF 5-DAY B.O.D. ADDED PER GRAM OF VOLATILE TOTAL SOLIDS ADDED
○ 37°C.
+ 30°C.
× 25°C.

FIG. 6

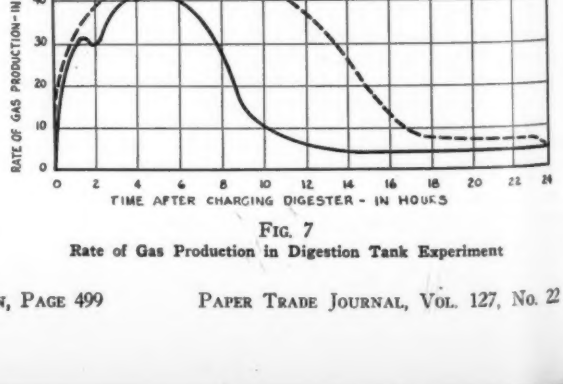
RATE OF GAS PRODUCTION - IN ML. PER HOUR.
GAS PRODUCED AT 500 ML. LOADING
GAS PRODUCED AT 1000 ML. LOADING
TIME AFTER CHARGING DIGESTER - IN HOURS

FIG. 7
**Rate of Gas Production in Digestion Tank Experiment**

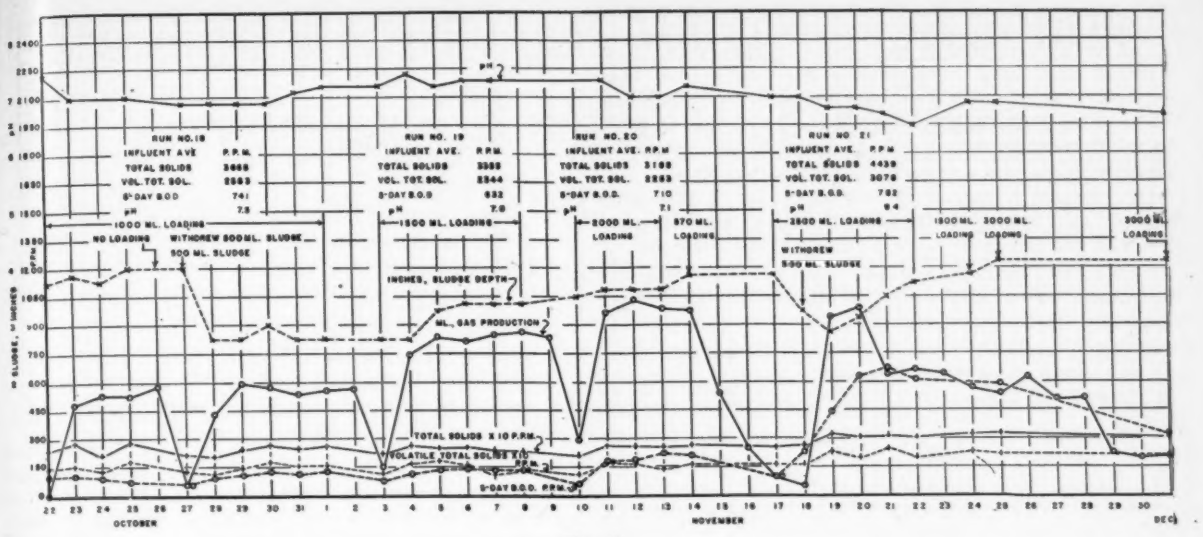


FIG. 8

**Laboratory Digestion of Settled Strawboard Waste 25° C. Incubation Oct. 22-Dec. 1, 1947**

greenish appearance and exhibited only a slight odor like that of decomposing barnyard manure. After several months time, the effluent removed from the digester had a brownish appearance like that of fresh strawboard waste and had little or no objectionable odor. After measuring the gas accumulated each day, it would be released in the laboratory. On occasions, the odor would be objectionable.

The agent or agents responsible for the high rates of decomposition of the organic matter are not definitely known. James B. Lackey, Editor of the Blakeston Publishing Co. and formerly Cytologist for the U.S.P.H. Service, examined a sample of material from the digester when it was operating on a 5.1 day detention period. His comments were as follows: "An examination of 3 or 4 drops of the freshly drawn warm material gave no evidence whatever of any active protozoa, no filamental fungi, no yeast, and no recognizable sulphur bacteria. A few cysts were seen which may have been the cysts of small flagellatted protozoa. Such bacteria as were seen appear to be nonmotile, except in rare instances. There were very many tenuous rods, no more than a micron in diameter and fairly large numbers of small organisms which were either cocci or else were extremely short rods. The number of living organisms would appear to be wholly at variance with the amount of B.O.D. reduction apparently accomplished." Based upon studies in other fields of investigation, Harry Gehm believes that the work is probably being accomplished by minute bacteria not easily seen under the microscope.

On two occasions the hourly rate of gas production was observed over a 24-hour period. A graph (Fig. 7) of these data shows very clearly that at these particular loadings and detention times that the activity, measured by gas production, was nearly all in the first hours after charging the digester.

### Excess Loading of the Digester

With the apparatus used it was apparently not possible to add more organic load to the digester than could be converted in the time allotted and at the temperatures 37 and 30°C.

In October it was decided to increase the increments of loading by increasing the volumes of waste added; it was not always possible to add the same amount of organic matter in the same volume of waste. Figure 8 shows the operation with loadings of 1000 ml., 1500 ml. being handled quite satisfactorily at 25°C. With the increase to 2000 ml., daily loading (1.9 days detention), it is apparent that the pH dropped rather abruptly and an increase in the B.O.D. of the effluent resulted almost at the same time. It was very apparent that the digestion tank was in difficulty under the 2000 ml. (1.9 day detention) loading. There was an immediate decrease in the gas production and the appearance was that the pH came up a little. In an effort to see what would happen should the digester be overloaded, a condition that might happen in any large plant installation, the loadings were applied as shown in Fig. 8 November 17 to December 1. The pH went to a low of 6.5 and the gas production decreased and it was apparent that, even with additions of waste, no increases in gas production were noted. Figure 9 shows spasmodic additions of waste with pH going below 7.0. The B.O.D. of the effluent went above 600 p.p.m. yet after periods of low or no loading the B.O.D. of the effluent would decrease indicating that the digester might be recovering.

From December 8 to December 16 a 1000 ml. load (3.8 detention) was applied. The digester did not seem to be able to handle this loading. It is true, however, that the strength of the waste being used at this time was 1250 p.p.m. of B.O.D. instead of the 741 p.p.m. that the digester had handled in October using the same detention time. After December 16 no waste was added and the digester seemed to be recovering as indicatd by pH, gas production, and B.O.D. of the effluent or supernatant. A number of volatile acid determinations were made during the period December 6 to December 21, and it would appear from Fig. 10 that when the volatile acid concentration was over 1000 p.p.m. the B.O.D. of the effluent was also very high. With a decrease in volatile acid concentration there was an increase in gas production and pH and a decrease in the B.O.D. of the supernatant or effluent.

This information indicates that the process can be over loaded and that it takes a long time to get it under control again. It will be necessary to carry the studies on to show whether a digester, that is once overloaded, can ever be expected to produce the excellent results

obtained in the earlier studies.

One of the strawboard mills in the Middle West uses a rather large area for lagooning the total waste. The large quantity of solids that must be discharged has filled up much of the available area. The effluent that is produced by these lagoons has been found to be exceptionally low in B.O.D. during the summer months.

Dr. Herman Kessener who visited the U. S. this past summer stated that in Holland strawboard waste digestion with gas recovery has been practiced for some years.

Both of the methods require longer detention periods than have been found necessary in the laboratory experiments.

It seems doubtful whether the slow digesting sludge can be economically or conveniently handled in large installations of lagoons or semisludge digestion lagoon-tanks.

## Conclusions

1. Settled strawboard waste with a B.O.D. of 600 to 900 p.p.m. will have a B.O.D. of less than 75 p.p.m. if digested at 37°C.

2. The digestion period necessary to accomplish the good effluent is less than two days.

3. An effluent of less than 100 p.p.m. B.O.D. can be produced with a 2-day detention at 30°C.

4. To produce an effluent with 100 p.p.m. B.O.D. at 25°C. requires almost 4 days detention. Marked reductions in B.O.D. can, however, be produced with shorter detention times and still maintain good digesting conditions.

5. Practically no sludge is produced in the rapid digestions at the temperatures of 37, 30, and 25°C.

6. The primary sludge that would be produced in preparing the settled strawboard waste would have to be treated with chemicals and vacuum filtered or digested in separate digestion tanks and then filtered if present known methods of disposal were used.

Acknowledgement is made to Russell L. Winget and Harry Gehm and the National Council for Stream Improvement for their sponsorship and assistance in making these studies possible. Appreciation is expressed to R. F. Burns and B. F. Stahl of the Terre Haute Paper Co. for their contributions of practical knowledge which aided in this particular work. Russell Shew of the Ball Bros. Co. mill at Noblesville assisted greatly in obtaining the necessary samples for the experiments. Some of the data herein presented were obtained and compiled by G. Erganian prior to his present work with the Indiana State Board of Health.

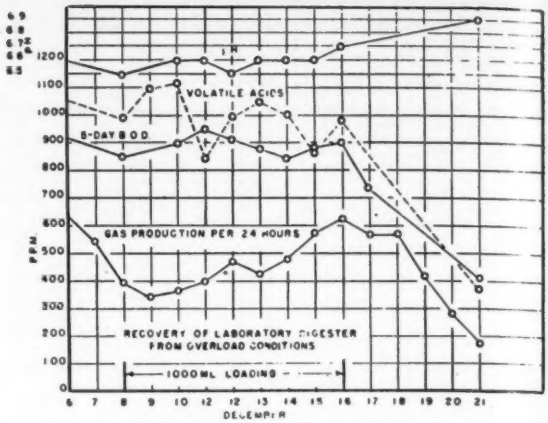


FIG. 10

## Literature Cited

1. Technical Bulletin No. 7, Strawboard Waste Research Report, National Council for Stream Improvement, Inc., January, 1947.
2. Technical Bulletin No. 15, Strawboard Waste Research Report, Second Annual Report, National Council for Stream Improvement, Inc., December, 1947.
3. Stahl, B. F., What Can You Learn with a Pilot Plant?, Proceedings of the Third Industrial Waste Conference, Purdue University.
4. Hargleroad, J. C., Experiments on the Disposal of Strawboard Wastes, A Thesis on file in the Purdue University Library.
5. Erganian, G., and Bloodgood, D. E., Characteristics of Strawboard Waste, *Sewage Works J.* 19, No. 6, p. 1021, November, 1947.
6. Eldridge, E. F., and Mallmann, W. L., Digestion of Sludge from Strawboard Waste, Bulletin No. 39, Michigan Engineering Experiment Station, East Lansing, Michigan (July, 1931).

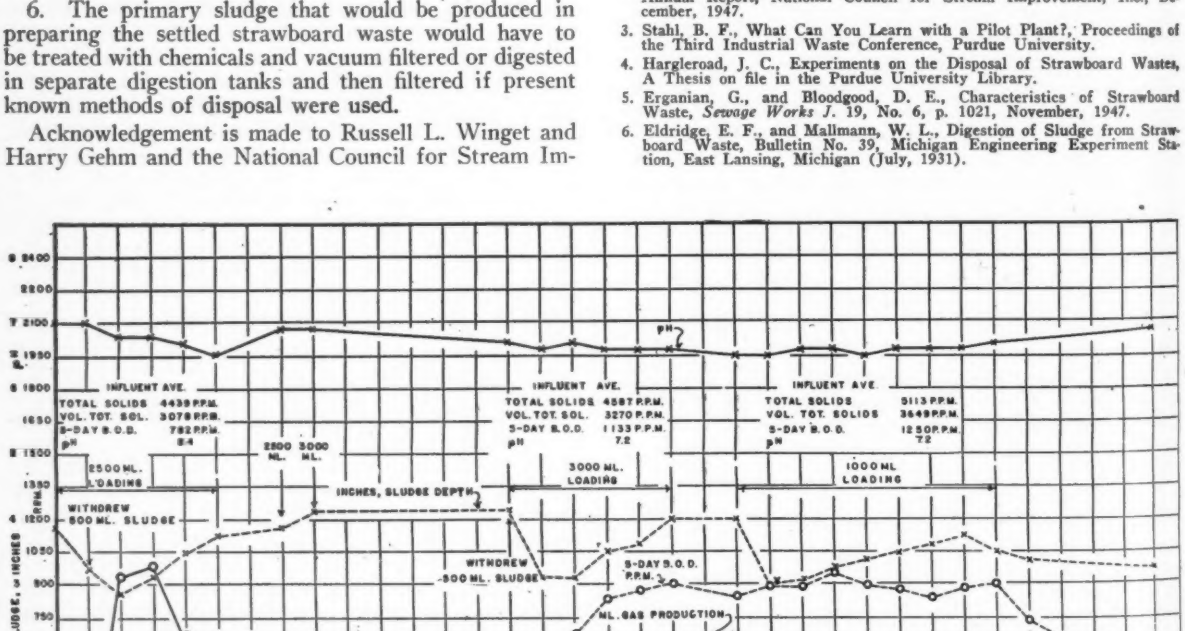


FIG. 9

# Effect of Fourdrinier Machine Operating Variables as Related to Formation of Sulphite Papers*

By Noel A. Phillips[1]


## Abstract

*Due to the sulphite fiber's inherent length, flexibility, and relatively easy beating properties, the attainment of uniform formation and good strength properties in sulphite papers is sometimes difficult to obtain. Assuming proper stock preparation for the particular grade of paper desired, the fundamentals of fourdrinier operation for sulphite sheets of uniform formation are (1) uniform flow of stock through the slice with equal volume and equal velocity across the wire with freedom from foam (2) the stock velocity from the slice should equal the wire speed and (3) the water in the sheet should be carried down the wire as far as the dandy roll. If ideal formation could be rated as 100%, 50% of this ideal formation is dependent upon proper stock preparation, and the other 50% is dependent upon proper manipulation of the fourdrinier.*


The manufacturer of sulphite papers is usually presented with the nebulous statement that a "sheet of good uniform formation" is desired along with optimum strength factors. In view of the sulphite fiber's inherent length, flexibility and relatively easy beating properties, the attainment of good formation in sulphite papers is sometimes quite difficult to obtain. From the theoretical standpoint the optimum in good formation and strength properties is secured in the random oriented handsheet. The sheet of handmade paper is prepared by dipping a wire covered mold into a vat of well agitated stock and gently shaking the mold while the water gradually drains from the sheet on the wire. By analogy the mold has become the movable wire of the fourdrinier table, the uniform, well agitated stock has become the stock flowing through the slice, the gradual drainage of water through the sheet is represented by the sheet traveling from the slice to the dandy roll, and the gentle shaking of the mold by hand has become the mechanical shake of the fourdrinier table. With these basic factors in mind the actual formation of the paper on the fourdrinier machine can now be discussed.

## Approach Flow of Stock

### Headbox and Slice

The first step in forming a good sheet of sulphite paper is to insure that the discharge of stock from the machine screens is designed in such a manner that there will be no cascading or spouting of stock into the headbox. Such streams of fairly high velocity stock will carry the fibers through the slice and result in streaks of uneven weight, caliper, and appearance. It is best to have the screens discharge into a long trough the width of the machine and pass over and under baffles into the headbox if the conventional headbox with straight slice or a pressure inlet such as the Voith inlet is used. If some of the patented flow spreaders or hydraulic inlets are used screens usually discharge into large diameter pipes leading to these devices.

In the manufacture of a large variety of sulphite papers over a wide speed range the Voith pressure inlet or similar stock inlet is to be preferred to the conventional straight slice for the best formation. These inlets are of the nozzle type in which the slice itself is adjustable up and down for height and the sheet can be leveled across its width by varying the position of the flexible rubber slice lip. If further versatility is desired it is well to have provisions for a straight slice further up the wire. This will permit the use of a pond on the wire if it is desired in running the heavier weights of sulphite papers at slower speeds. However, if only the highest quality sulphite papers are required at moderate or low speeds the conventional over-and-under baffle headbox with straight scissors type slice is satisfactory. Regardless of the type of headbox or slice used certain conditions must be adhered to if the best possible formation is to be attained in sulphite papers. These conditions are as follows:

1. The headbox and slice must extend across the entire width of the wire.
2. Have provisions for rectifier rolls close to the slice to break up lump formation, prevent fiber flocculation, and help to cross the suspended fibers. If rectifier rolls are used, provisions must be made for good showers over the roll. It should be noted that on long fibered stock like sulphite at moderate speeds the use of perforated rectifier rolls is preferable to stationary perforated boards or pin racks as the stock tends to clump on these stationary impediments to stock flow. Such clumps later break away and form clots in the sheet with resultant poor formation, poor strength and possibly cause breaks.
3. Stock flowing to and through the slice should be of uniform volume, uniform velocity and free from foam across the entire width of the wire.
4. Gentle showers over the conventional type headbox or flowbox cut down the foam.
5. Throughout the approach flow system to the wire the stock should travel only over rounded corners—no sharp edges to catch fibers.
6. Provision should be made to carry sufficient head behind the slice.

### Headbox Consistency

In manufacturing sulphite papers the consistency of the stock in the headbox is going to vary upon (1) the basis weight of the sheet, (2) the drainage rate of the stock, (3) the temperature of the stock, (4) the machine speed, and (5) the forming ability of the fourdrinier table itself. For most grades of sulphite papers, exclusive of tissues, the consistency of the headbox stock will probably vary from 0.25% for bonds up to 1.0% consistency for tags, index, etc. It should be remembered

[1] Member TAPPI; Hollingsworth & Whitney Co., Waterville, Me.

that the best formed sheet of paper will be made that carries the water down to the dandy roll; it is necessary to adjust the consistency slightly during the run to maintain this objective.

### Slice Velocity

To obtain the best possible formation in a sulphite sheet the velocity of the stock leaving the slice should approach the speed of the wire as closely as possible. If the stock velocity is much less than that of the wire there tends to be backward waves across the sheet, while if the velocity is much greater there will be forward waves across the sheet. It should be remembered that there is a mathematical relationship between stock velocity and the head of stock behind the slice with the wire speed. Numerically this relationship can be expressed as $V=C\sqrt{2gh}$, where $V$ is the velocity of the stock in feet per second, $C$ a constant equal to 0.95, $g$ the acceleration due to gravity or 32.2 feet per second, and $h$ the head in feet in the pond. For example, a machine running at 100 feet per minute requires a head behind the slice of about ½ to ⅝ inch, while at 250 feet per minute the head required becomes about 3 to 4 inches and at 600 feet per minute the head has increased to 18 to 19 inches. It is important to remember this relationship as the wire speed is increased.

## Fourdrinier Factors

### Wire Mesh

The mesh of the wire used in making sulphite papers has a direct bearing on the formation of the sheet. Other factors being equal, a finer mesh wire undoubtedly results in better formation due to improved retention of fine fibers, fillers, and dyestuffs as well as helping to retard the pasage of water through the sheet. Against better formation must be balanced shorter wire life for the finer mesh wires. In making sulphite papers for coarse end uses a more open wire should be used. For most grades of sulphite papers, except tissues, 55, 60, 65, or 70-mesh wires will yield the best formation depending upon the drainage rate of the stock, machine speed, presence or absence of fillers, and strength properties required. The twill wire weave will probably give greater wire life than the plain weave but there should be little or no difference in the formation of the sheet.

### Wire Pitch

The pitch of the wire down from the breast roll to the couch has the effect of increasing the head of the stock. On most sulphite papers extreme downward pitch as used on newsprint machines is not necessary. On some grades of sulphite papers it is necessary to pitch the wire down from the couch to the breast roll to obtain a fuller effect of shake.

### Dandy Roll

The use of a dandy roll materially improves the formation of sulphite papers in that it tends to make the sheet more even in texture by closing up the top side of the sheet. In order to get the full effect of the dandy roll, the sheet should be run wet to the dandy roll. A dandy roll run dry has little effect on the sheet.

### Shake

On long fibered sulphite sheets run at moderate speeds on older machines the shake exerts an appreciable effect on formation. The length of the shake and its speed should be variable while the machine is running. It is difficult to make specific recommendations as to the amplitude and speed of the shake for this is a variable requiring change. However, on wide machines running at higher speeds with a considerable downhill pitch to the wire, the shake has but little effect on formation.

### Other Factors

*Number and Size of Table Rolls.* These rolls effect not only the drainage of water through the wire but they also result in thin spots in the paper if the table rolls are run out of line or are too many for the machine speed.

*Suction Boxes.* The suction boxes are a limiting factor in carrying water down the wire. The number of suction boxes also tend to limit the maximum basis weight that can be run on any machine.

*White Water System.* If a close formation of a heavily filled sulphite sheet is desired, a fairly closed machine white water system is necessary. From an economic standpoint a fairly closed system should be employed with sulphite papers as this tends to improve not only the formation of the sheet by a better retention of finer fibers but also saves money in terms of fiber saved.

*Speed.* Wire speed, along with other factors such as stock drainage, water carried in the sheet, etc., has an effect on formation. Closely tied in with wire speed is wire length, for as the speed is increased a longer length of wire will permit a greater length of time for actual sheet forming to take place.

*Chemical Agents.* The possible use of materials such as CMC, methocel, guar, and similar agents for deflocculation of the fibers.

*Forming Boards.* The use of forming boards or extra long pieces of apron cloths is sometimes required if extremely long fibered, free sulphite sheets are to be made.

## Fundamentals of Operation

The fundmentals of fourdrinier machine operation for the best possible formation of sulphite papers can be summed up by stating that (1) ideal formation starts with a uniform flow of properly prepared stock through the slice with equal volume and equal velocity across the wire with freedom from foam, (2) the stock velocity from the slice should equal the wire speed, and (3) the water in the sheet should be carried down the wire as far as the dandy roll. The factors that effect these three conditions should be manipulated until these conditions are met if good formation is to result in the finished sheet.

## Controls Used

The controls used should start back with proper regulation of stock consistency from the jordans to the machine stuff box. Following this headbox drainage rates, temperatures, slice openings, shake strokes and speeds, flat box vacuum carried, couch vacuum carried, and machine speeds should be noted. These controls will be effective if supervisors look over the results of the control sheets. The machine tenders should be on their toes to note variations in the machine operating variables at all times.

## Ideal Formation

It is true that a sheet will seldom be better than the furnish it was made from, yet it is possible and sometimes too probable that a poor sheet, from the formation standpoint, is made from the best of sulphite pulps carefully prepared under controlled conditions. If ideal formation in a sulphite sheet could be classified by 100%, machine conditions are responsible for 50% of the ideal formation, and the other 50% of ideal formation would be due to correct stock preparation for the grade being run.